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The

ALIND

Chronicle



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MAN AND SUPERMAN

THE ALIND Chronicle

(After Bernard Shaw—but not very much after!)

Effective from the beginning of this year, we have a Supervisory Study Group—Company News item.

"No one tells me what my job is

Tho' it's exciting—like one of my hobbies!"

This from a so-called pace-setter—

That guy ought to know better—

Upset us somewhat, won't it?

So, on this sublime idea we hit.

A Supervisory Study Group, we said,

Would make 'em think before they leap'd to bed,

About the things they should know, those so many "aches",

Without turning them into insomniacs!

Here, then, are its objectives,

Without any lyrical adjectives,

Like 'laudable', 'worthy', and so on,

But to go on—

To wage a pitiless war, like a 'Tartar,

On ignorance—to give it no quarter;

To try to understand responsibility

To the best of one's ability;

To learn to relate

And translate

An abstract theory,

Dry and dreary,

Into one of concrete realities;

(Else, it will be all it is!)

And to get the other chap's point of view

Without one's own face turning an ultra-marine blue!

Well,

In a nut-shell,

The goal is to make, as far as we can,

A Supervisory man into a Supervisory superman!

ENVOY

Because of his editorialising in verse

This scribe shouldn't be thought of any the worse;

He could've said it all just as well in plain or purple prose,

But then he reason'd: 'Would a rose smell less sweet,
if not called a rose!'

"WHAT do you think of metal as white as silver, as unalterable as gold, as easily melted as copper, as tough as iron, which is malleable and ductile and with the singular quality of being lighter than glass?"

The reference is, of course, to aluminium, but the copy is not the product of an advertising agency of our day.

The words are those of Charles Dickens, immortal creator of *Pickwick Papers*, and he penned this para in 1857. And only in 1855 had this remarkable new metal made its debut, at the Paris Exhibition, the same year Napoleon III ordered a rattle of aluminium for his son.

Currently, however, there is a world-wide shortage of the metal. World output of aluminium in 1955 was three million tons, of which India produced about 7,000. The target fixed for the first Five-Year Plan was 20,000 tons, but the country was nowhere near this target. The target fixed for the Second Plan is 40,000 tons of which the Indian Aluminium Company's new smelter at Hirakud is expected to give the country an annual production of 10,000 tons.

Aluminium is at present no doubt in relatively tight supply, but world producers of the metal are on the brink of an expansion which over the next few years would increase annual output capacity by close to one-third.

Increased use of aluminium by Power companies in the U.S.

The substitution of aluminium for copper by electrical utilities began with the earliest sales efforts for the white metal. For example, as early as 1926, Pennsylvania Power and Light Company used aluminium for its 220-kV transmission lines. P. P. and L. now uses aluminium for all such high voltage lines. A few years ago, the company began using aluminium on lower voltage lines and in substations.

Other utilities in the U.S. are, also, big users of aluminium, Tampa Electric Company of Tampa, Florida, for example, will use aluminium wire instead of copper in future additions to its medium voltage distribution, according to the company's President.

Reason for the change: "Widening differences" in price between the two metals.

Western Electric Company, perhaps the biggest copper consumer in the U.S., announced in September that it aimed to use aluminium instead of copper in making cable wire.

Officials of the big manufacturing unit of the Bell System said spiralling copper prices and cyclic shortages had caused the company to move ahead with a definite engineering development programme looking towards the substitution of aluminium for copper in its manufacture of telephone cable.

Since the end of World War II, great inroads have been made by aluminium cable in areas of the electrical field, where copper wire chiefly ruled. In the high voltage outside transmission lines, ACSR has been used practically cent-per-cent for many years, such use starting circa 1898. In the sub-transmission category (with the approximate rating of 66 kV) nearly all lines are now in aluminium or ACSR. Going down the several channel groups of electrical distribution, we come to the primary distribution lines ranging from 12.5 kV to about 25 kV. About 70 per cent of these are now in the light metal.

In the next category known as secondary distribution lines, representing the feeders to homes and shops, the shift to aluminium is increasing rapidly, and the light metal may soon possibly account for 80 per cent in this category.

Since about 1951, there has been a marked trend towards aluminium in the building of service drops, usually consisting of two or three wires going from the feeder lines to homes. The reasons for the switch were economies resulting from cheaper aluminium and the effective application of sound engineering.

At first there were difficult problems in making good connections and the "die-hards" in the utilities were often opposed to the light metal. The connector trouble has largely been solved by the use of an aluminium compression sleeve which is applied by a special tool providing great mechanical pressure.

Aluminium strip for Electrical Conductors

A new development in the winding of electro-magnetic coils for use in transformers, solenoids and some motors and generators which is reported in a recent issue of *Light Metal Age* is expected to reduce the cost of coils, appreciably. The new method involves winding coils with strips of aluminium foil or thin aluminium sheet, instead of with the conventional electrical wire.

Construction of coils wound in this manner and successful testing of them has been announced by Reynolds Metal Company, Louisville, Kentucky. The firm explains that the new spiral winding of coils with aluminium utilizes anodic coatings for aluminium which serve as insulation for the strips of metal wound into a coil, replacing the paper, glass or enamel insulation normally used with wire coils. The methods and materials employed permit the production of lightweight, compact coils capable of operating at high temperatures and with excellent heat dissipation features.

In most equipment where the space factor is important, this new development makes possible the use of aluminium as magnet conductor with no increase in equipment size. Spiral winding of the coils subjects the conductor insulation to turn voltage only and accordingly, normal layer insulation can be eliminated. This saving in space, coupled with that derived from the use of the very thin anodic films for insulation and the lack of voids in the completed windings, accounts for the compactness of the coils.

Further space savings are afforded by the excellent heat transfer characteristics of the coils. Since every turn of the coil is exposed to the outside, no hot spots are encountered and cooling ducts can be eliminated. Fins may be incorporated in the coils to provide additional cooling if desired, without materially increasing their size.

The anodic coating, consisting of aluminium oxide—a chemically inert material and an excellent electrical insulator—reduces the possibility of a coil's "burning out", since the melting point of the anodic coating is higher than that of aluminium itself.

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Technical notes

Fractional horse-power motors

The use of aluminium in fractional horse-power motors has been increasing steadily for over 20 years. The more common uses include rotors, stator, frames, end shields and bearings.

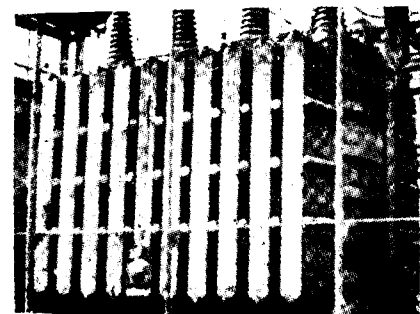
Cast aluminium rotors are no longer news. The advantage of economical production, uniform conductivity, and integrally cast fins and baffles are being exploited by practically all manufacturers of fractional horse-power motors.

Series motors for applications such as office machines and sewing machines employ cast aluminium frames to obtain rigidity, low noise levels, and economical one-piece construction. Small shaded pole fan motors have aluminium stators for the same reasons. So far, aluminium stators have not proved to be economical in the larger frame-sizers.

The use of cast-aluminium end-shields has increased rapidly since World War II—mainly to obtain lighter weight, improved appearance, or lower cost. In some lines, the transmission from cast iron to aluminium is 100 per cent complete.

Aluminium windings

Several countries are now manufacturing aluminium-wound transformers. In France, for example, there is a 40,000-kVa transformer in the Echaillon Power Station. This transformer is one of the first to be constructed with aluminium windings.



Aluminium-wound transformer.

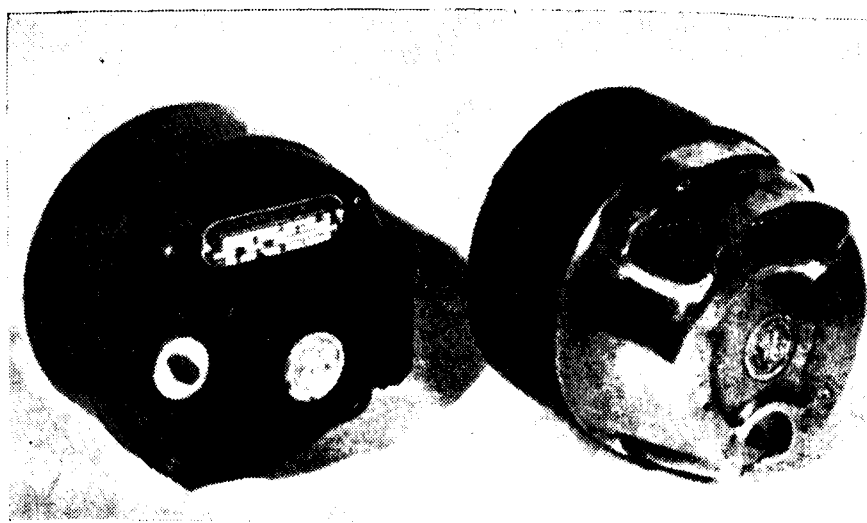
Aluminium Industry in India :

The Aluminium Centenary which was celebrated in Bangalore in September 1955 by the premier scientific societies in India may be said to have served the very useful purpose of focusing attention on the role of aluminium in the economy of some of the country's vital industries. The first production of aluminium started in India in 1943 from imported bauxite, and in the following year Indian raw material was used in producing aluminium ingots. The current production of the metal in the country amounts to about 7,000 tons while the consumption has been estimated at about 17,000 tons per annum. It is obvious that a large part of the country's requirements of aluminium and its alloys have to be met from imports. In the words of Dr. J. C. Ghosh, Member, Planning Commission, New Delhi, the aluminium industry is one of the industries under the First Five-Year Plan, which has, for several reasons, shown wide disparity between target and actual achievements. It is obvious, therefore, that India has to depend on imports of this basic industrial raw material for a longer period than envisaged earlier.



Prof. M. S. Thacker.

Professor M. S. Thacker, Director of Scientific and Industrial Research, emphasised, in his inauguration speech, the need for the replacement of imported copper in the heavy electrical industry of this country. He dwelt at length on the need for research on aspects pertaining to the development of new alloys of aluminium, which could serve effectively as electrical conductors. As the anticipated consumption of ACSR and all aluminium conductors would be around 15,000 tons in 1960-61, he said, aluminium consumption would be higher than ever before.



Die-cast aluminium replaced cast-iron in end-shield of this small GE motor because of lighter weight (1.30 lbs. compared with 3.15 lbs. in iron); cast-in nameplate; lower machining cost; better appearance.

MODEL "B" SCREW COMPRESSOR

ON Fig. 1 is illustrated a side and top view of the Model "B" Compressor. The parts are indicated by numbers and listed below.

Note : Throughout the following text on the Model "B" Compressor numbers of parts mentioned refer to those listed and indicated on this page.

No. of part. Name of part.

- | | |
|----|------------------------------------|
| 1 | Frame |
| 2 | End Link |
| 3 | Spindle |
| 4 | Spindle Sleeve |
| 5 | Die Holder |
| 6 | Lock Nut |
| 7 | Lock Washer |
| 8 | Die Holder Guide and Wearing Plate |
| 9 | Top Link |
| 10 | Knurled Pin |
| 11 | Hinge Pin |
| 12 | Die Clip Flange Bushing |
| 13 | Ball Stop Pin |
| 14 | Socket Wheel Washer |

No. of part. Name of part.

- | | |
|----|--------------------------------|
| 15 | Socket Wheel Cap Screw |
| 16 | Socket Wheel |
| 17 | Die Clip |
| 18 | Hinge Pin Bushing (Short) |
| 19 | Hinge Pin Bushing (Long) |
| 20 | Die Clip Stop Pin |
| 21 | Die Holder Bolt Lock Nut |
| 22 | Die Holder Bolt (Lower) |
| 23 | Die Holder Bolt (Upper) |
| 24 | Chain Clip |
| 25 | Chain |
| 26 | Chain Anchor Screw |
| 27 | Hinge Pin Bushing Set Screw |
| 28 | Hinge Pin Washer Screw |
| 29 | Die Holder Guide Screw |
| 30 | 13/16" Steel Ball |
| 31 | 5/16" Steel Ball (60 balls) |
| 32 | Spindle Sleeve Set Screw |
| 33 | Hinge Pin Washer |
| 34 | 1" Diam. x 42" Long Steel Bar. |

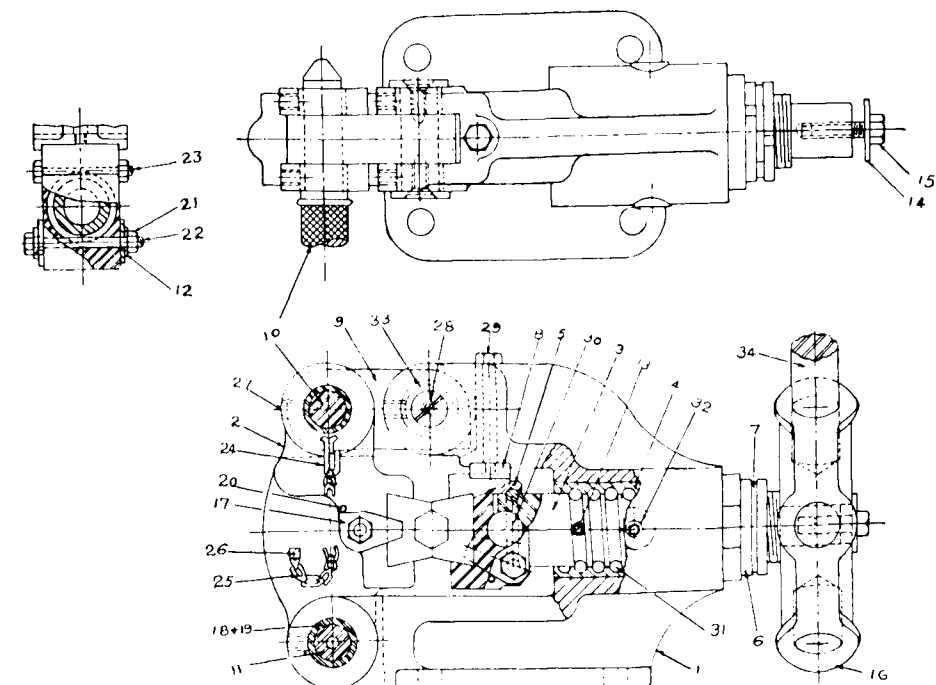


Fig. 1

The compressor unit is attached to the cover of the shipping case (cover serves as base for the compressor) so that when it is required for use, it is only necessary to unfasten the cover, lift it up, turn it over and fasten it again to the main part of the shipping case. (Figs. 2 & 3).

The weight of the compressor and its wooden case is approximately 89 lbs.

The compression action of the Model "B" is of the screw type, that is, the dies by means of a ball bearing screw spindle (Part No. 3, Fig. 1) which when turned (clock-wise) by means of the wheel and lever (Parts 16 and 34) causes one die to move against a stationary one. To release the pressure the wheel and lever are turned in the opposite direction (counter-clock-wise). Figure 4 shows a set of dies used in the Model "B" compressor for applying tubular steel sleeves, and Figure 5 for applying tubular aluminium sleeves.

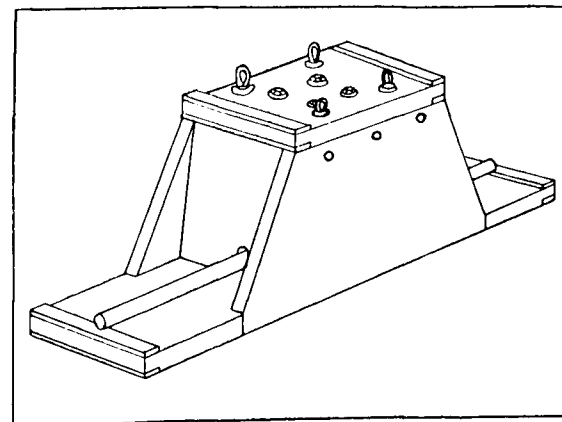


Fig. 2

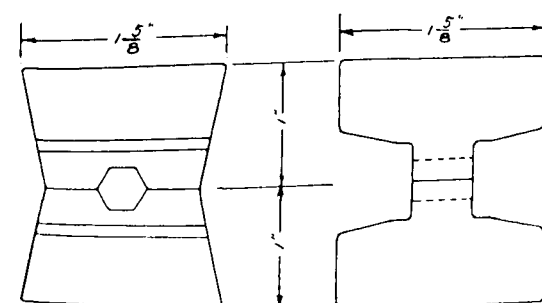


Fig. 4--For Steel.

Care of the Model "B" Screw Compressor :

The following care should be taken :

1. Keep the compressor clean. After a job is completed and before storing, the compressor should be thoroughly cleaned (and greased if required).

2. Dies must be kept clean and free from filler paste.

3. For efficient operation, the moving parts of the compressor should be cleaned and greased periodically, depending on use.

Note : How to clean and grease the compressor is described under the heading "Maintenance of Model 'B' Compressor".

4. The 42-inch lever provided for operating the press, allows one man to develop a pressure of about 35 tons

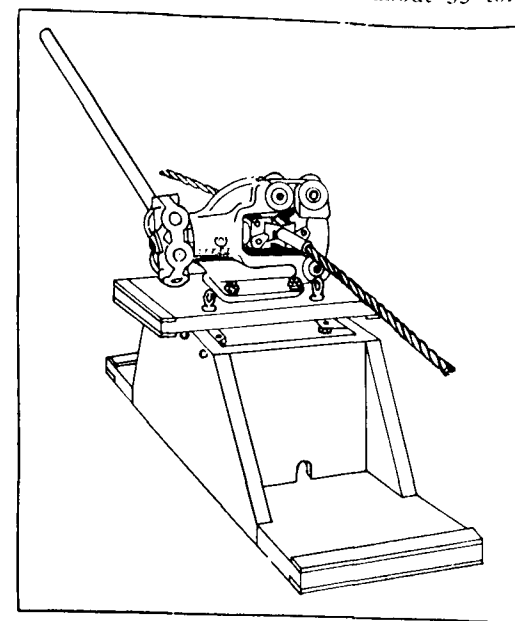


Fig. 3

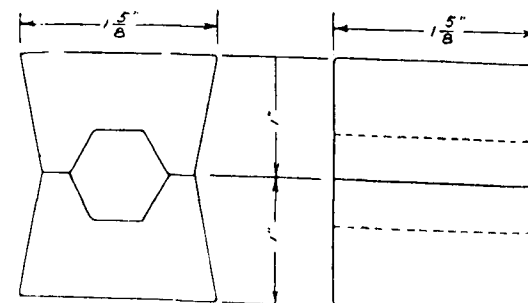


Fig. 5--For Aluminium.

although less pressure is required for applying any joint or dead-end for which the compressor is designed. A longer lever is not required.

5. Compressors are adjusted to provide the proper amount of die travel to permit complete compression without over-stressing the compressor. Care should be taken when compressing to stop when the dies barely come together. Any further compression does no good and will cause needless overload on the machine.

Note : The factory stop adjustment (parts 6 and 7) should not be altered in the field except where required by wear or loosening then it can be corrected by following the procedure described under the heading "Adjustment for providing proper Die Travel".

6. The compressor should be stored in its shipping case.

Operation of the Model "B" Screw Compressor :

To operate the Model-B it is only required to turn the socket wheel (part 16) by means of the steel bar (part 34) see Fig. 1 for description of these parts. To compress, turn the wheel in a clock-wise direction ; to release pressure, turn it in a counter-clock-wise direction. If the stop-adjustments (parts 6 and 7) are in their correct positions, complete compression is made when the inner lock-nut (part 6) bears on the spindle sleeve flange (indicated in Fig. 1).

Compressing Joints and Dead-Ends : The Model "B" compressor is used for compressing and dead-ending, on small conductors (7/.186" Dog or smaller).

The following is the sequence in making a compression joint or dead-end :

1. Select the required set of dies and place in the holders as follows :

Loosen the nuts of the die clips and turn the clips to allow the dies to be placed in the holders (Fig. 6).

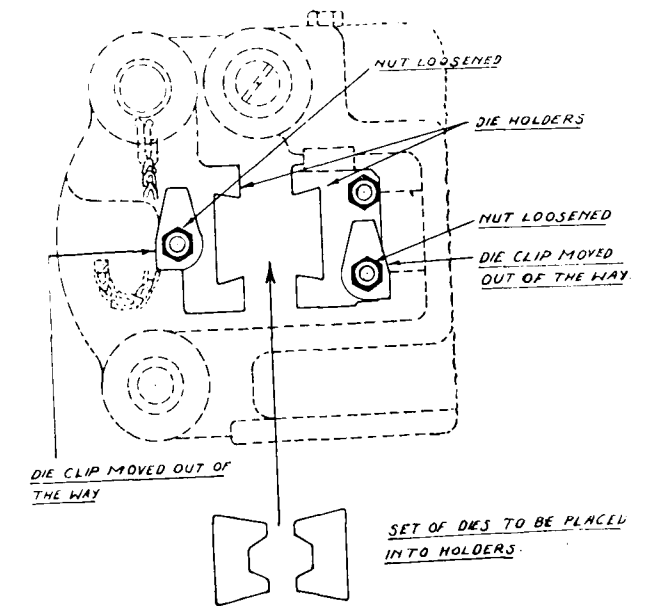


Fig. 6.

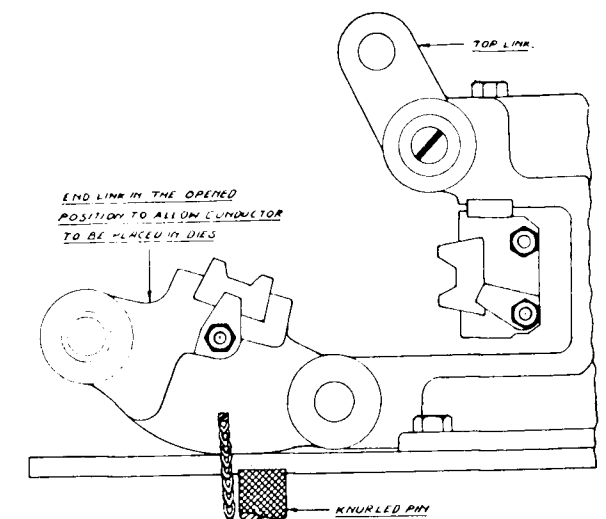


Fig. 7

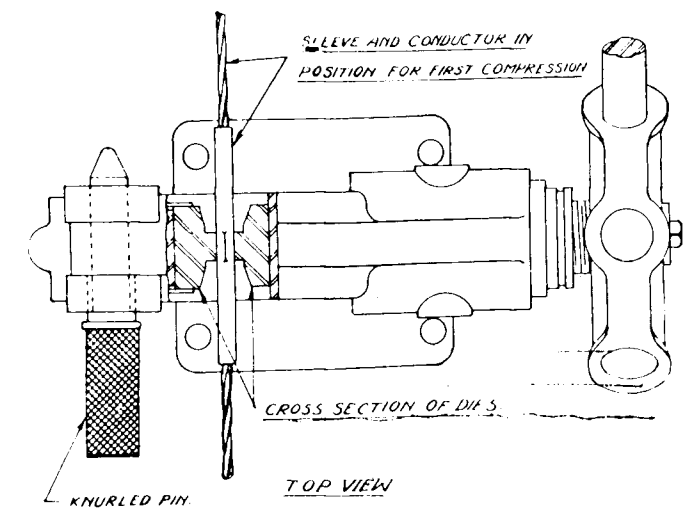


Fig. 8

When dies are in position in their holders, turn the clips back so that they lock the dies in place, then tighten the die-clip nuts (see Fig. 1 which shows the dies in position).

2. To place the conductor and jointing sleeve or dead-end assembly between the dies, remove the knurled pin so that the end link can be opened, as illustrated in Fig. 7.

3. Place the conductor and hardware to be compressed, between the dies, replace knurled pin, then adjust conductor on the dies in position for the first compression as shown in Fig. 8.

4. Operate the compressor as described above.

Maintenance of Model "B" Compressor : The compressor before it leaves the factory has been thoroughly and properly lubricated, but after considerable use in the field, further lubrication of the moving parts is necessary.

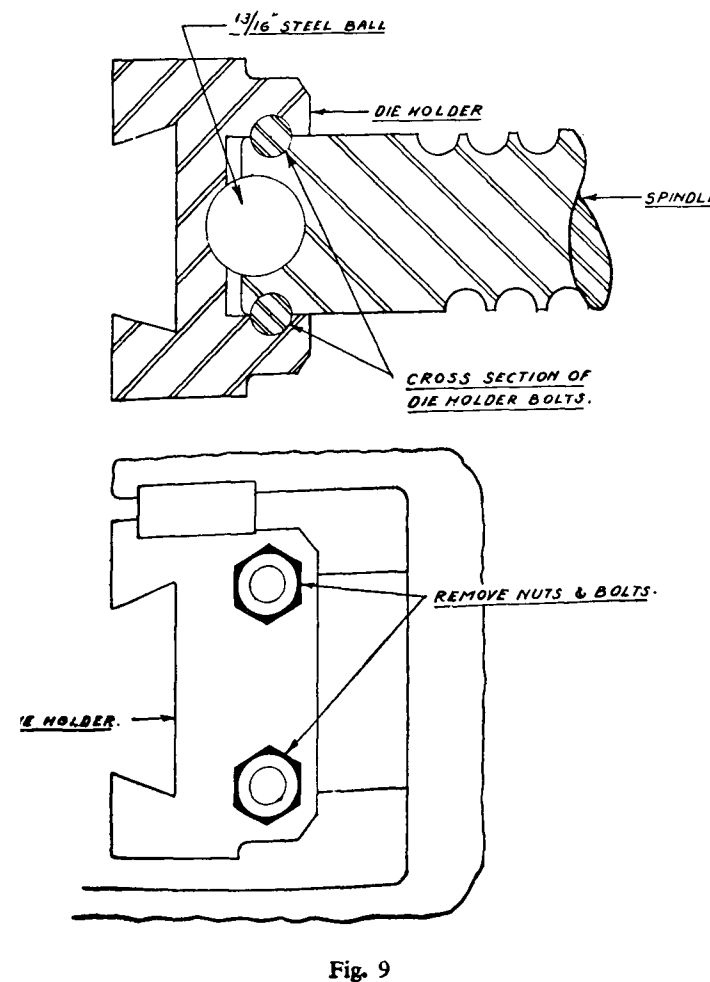


Fig. 9

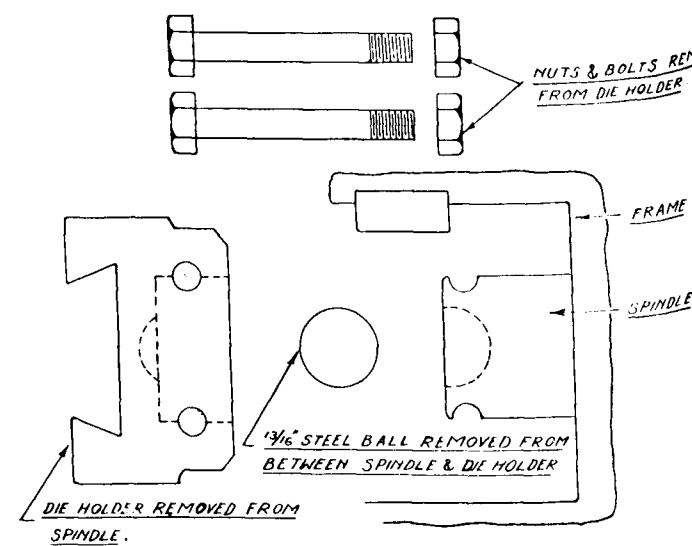


Fig. 10

Cleaning and lubricating : This is done as follows :—

1. Remove the two die holder bolts (indicated in Fig. 9) which allow the die holder and 13/16" steel ball to be detached from the end of the spindle (Fig. 10).

2. Then, by removing the cap-screw and washer (parts 15 and 14, Fig. 1) from the other end of the spindle, the socket wheel (part 16) can be removed.

Warning : The position of lock-nuts and lock-washers should not be altered when removing the spindle (Fig. 11). See heading "Adjustment For Providing Proper Die Travel", for further information concerning these adjustment-parts.

3. The spindle can now be removed by rotating it in a counter-clock-wise direction.

Warning : When backing out the spindle, the 5/16" balls (60 of them, part 31) will begin to drop out and care should be taken to put the balls in a safe place so that none will be lost.

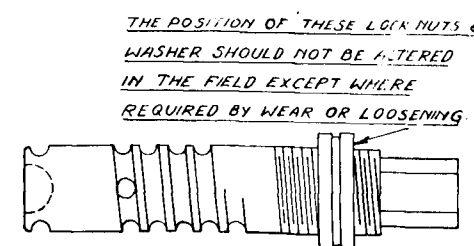


Fig. 11

4. When the spindle has been completely removed (Fig. 11) it should be cleaned with an all-purpose solvent, such as varsol. Also clean the 60 balls (part 31) and the grooves of the spindle sleeve (part 4), so that grit or other foreign matter which may have found its way into the machine is removed completely.

Note : The position of the lock-nuts and lock-washer (indicated in Fig. 11) should not be altered when removing the spindle.

5. Apply a liberal coating of grease, similar to Shell's "Unedo Cup Grease No. 5", to the spindle and insert it part way into the sleeve again.

6. The compressor should then be turned on end and the balls gradually placed back in the spindle groove as the spindle is turned into the sleeve (Fig. 12). The spindle should be worked back and forth a few times to make certain that it turns freely.

7. The die-holder guide (part 8) should also be cleaned and a small amount of grease applied. Replace the die-holder and 13/16" Ball (indicated in Fig. 9). Attach the socket wheel to the spindle : the compressor is ready for operation again.

Adjustment for providing proper Die Travel : The Model "B" compressor is adjusted to provide the proper amount of die travel to permit complete compression without over-stressing the compressors.

This adjustment is made at the factory with the compressor under load while compressing a tubular fitting.

The factory stop adjustment should not be altered in the field except where required by wear or loosening. If the compressor requires adjustment because of wear or loosening, it can be done as follows :—

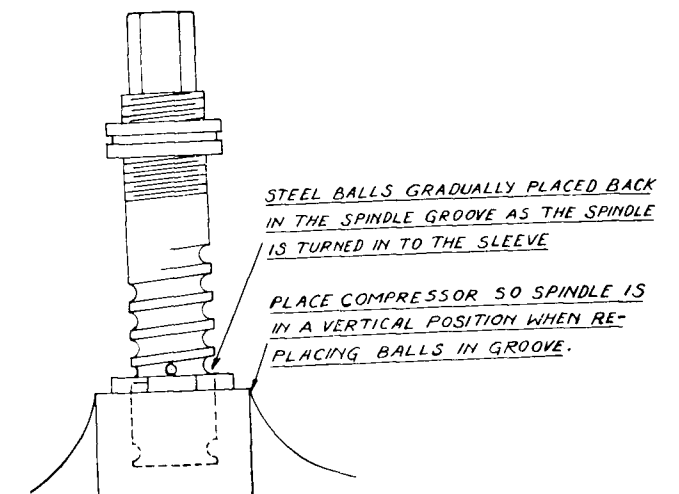


Fig. 12

While the compressor is under load (compressing a sleeve and dies barely touching each other), the lock-nuts (part 6) are turned until the inner lock-nut is tight against the flange of the spindle sleeve (indicated in Fig. 13) and the outer threaded lock-nut is tight against the lock-washer (indicated in Fig. 13).

The lock-nuts and lock-washers are thus bound tightly together to form a solid stop.

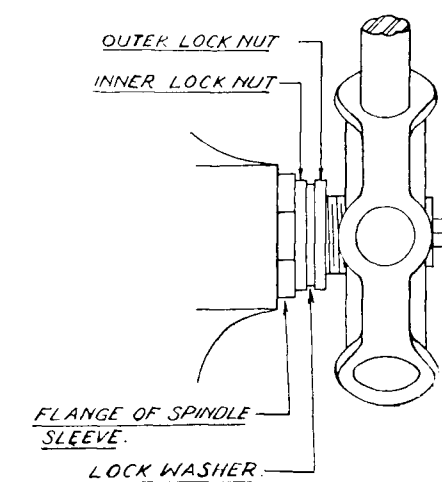


Fig. 13

Our Family

We said welcome to...

Probationers—**D. S. Arthur** (Chief Storekeeper), **K. M. John** (Rod mill Foreman), **K. N. Gopinathan Nair** (Welfare Supervisor), **K. Raman Rajan** (Tester), **P. S. Gopalakrishnan Nair** (Jr. Operator, Die Shop), **M. P. Aravindakshan Nair** (Draughtsman), **M. A. George** (Guard), **M. Gopinathan Pillai** (Guard), **Joseph Zacharias** (Stores), **G. S. Unnithan**, **C. Narayanan** (Registered Office), **P. Sivasankaran Nair** (Payroll).

Apprentices—**P. G. Damodara Panicker**, **T. G. Bhasaran Nair**, **N. Madhavan Nair**, **M. Shahudeen Sahib**, **A. Rajan Philip**, **K. Kumara Das**, **P. N. Abdul Aziz**, **P. M. Markose**, **Cyril William Antoney**, **M. Sadasivan**, **P. T. Kochu Thomas** and **G. Padmanabha Panicker**, **V. Y. Pappen** (Personnel Section), **Jacob Abraham**, **A. Abdulkadir Sahib**, **M. Shahul Hameed**, **Thomas Antoney**, **P. M. Varghese Panicker**, **T. K. Ramakrishna Pillai**, **N. K. Sukumaran Nair**, **M. Govinda Pillai**, **R. Velappan Nair**, **K. Madhavan Nair** and **K. C. Chacko** (Cable Mill).

(From L to R)

On the ground : Pappen and Tommy Louie.

First row : **K. Madhavan Nair**, **Thomas**, **Thomas Antony** (Captain), **M. R. G. Menon** (Secretary, Alind Recreation Club), **P. A. Ibrahim**, **K. Ramachandran Nair** and **T. K. Radhamonie**.

Second row : **M. Sadasiva Panicker**, **Natarajan**, **K. N. Gopinathan Nair**, **A. V. Thomas**, **M. Philips**, **Stephen D'Silva** and **C. Cheriyan**.

Third row : **R. Velappan Nair**, **A. Rajan Philip**, **P. Sukumaran Nair**, **Cyril William Antoney**, **K. Koyakutty** and **N. Neelakanta Iyer**.



Also to : **M. Pathrose**, **T. Antoney**, **Y. Pappachen**, **P. Leon**, **K. Thankappan Pillai**, **N. Chellappan Pillai**, **P. Thomas**, **S. Kannan** and **P. K. Pappu Pillai**.

We said farewell to...

K. Narayana Iyer (Supervisor), **P. V. Mammen** (Rod Mill) and **K. R. Manoharan** (Supervisor, Cable Mill).

K. Bahuleyan (Mech. Maintenance), and **N. Narayana Pillai**, Cable Mill.

* * * * *

In the District League Football Tournament conducted by the Quilon District Football Association in February/March 1956, the ALIND Football Team annexed the trophy, after defeating several teams, including the formidable H & C team.



We offer our congratulations and good wishes to the following newly-weds :

P. A. Joseph, Cable Mill, with Miss Celine.

A. K. Thrivikraman Nair, Cable Mill, with Miss Ammukutty.

A. Shahudeen Kutty, Cable Mill, with Miss Sainaba Beegam.

P. J. Varghese Panicker, Reel Packing, with Miss Aliyamma.

C. Gopinathan Nair, Cable Mill, with Miss Savithri Amma.

V. B. Rozario, Tool Room, with Miss Grace Irene Wood.

Miss Sallykutty, daughter of V. P. Samuel, Purchase Assistant, with Mr. George Mathews.

* * *

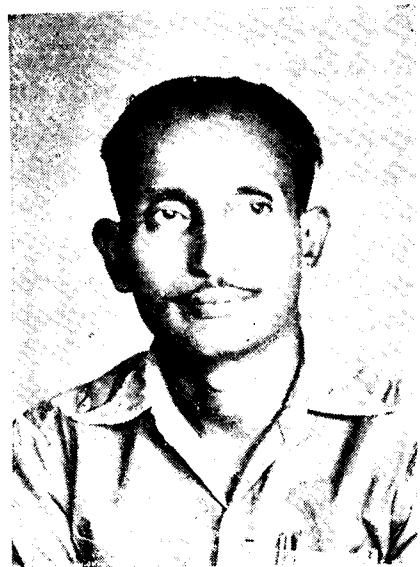
Our best wishes are also extended to Ramanan, son of Mr. S. Sury of Associated Printers, whose Upanayanam was celebrated on Feb. 23.

(1) Mr. George Mathews with his bride, Miss Sallykutty.

(2) V. B. Rozario with his bride, Miss Grace Irene Wood.

(3) Ramanan at his Upanayanam function : Seated by his side is Mr. Sury and standing behind is Mrs. Sury.





K. Nanoo Panicker.

K. Nanoo Panicker, Supervisor, Mech. Maintenance.

K. Nanoo Panicker spent the best years of his life in Colombo. Starting his career as a general fitter and the mechanic-in-charge of the gas engine, in a match factory, he achieved striking success. His employers found him "satisfactory and efficient in the discharge of his duties, very regular and prompt in his work". Later, he went to work in a timber estate to erect a Campbell 35 B.H.P. oil engine—which job he did "to the entire satisfaction" of his Manager. Nanoo Panicker was afterwards employed in the Swastika Mills, as a fitter and an engine driver for the small engine operating the drilling outfit in the mills. Yet another firm with which he saw service in Colombo was Brown & Co., Engineering Contractors.

Returning to India in 1940, Nanoo Panicker joined Harrison & Crosfield, as a fitter, and later went over to the P.W.D. Workshops, Trivandrum.

Joining Aluminium Industries as a mechanic, he graduated to his present position of a Supervisor. Nanoo Panicker's off-work interest is religion; he spends long hours in devotional meditation. Quiet by temperament, and quite attached to his work, Nanoo Panicker commands the respect of all who know him.

* * * * *



Ibrahim Kutty.

Ibrahim Kutty, Cashier.

Let all the learned say what they can, 'Tis ready money (even if it is the company's!) that makes the man!

Ibrahim Kutty, our Cashier, has money in the tills, and honey on his tongue. A *suave*, soft-speaking manner of man, Ibrahim Kutty joined ALIND in 1948 as a Stores Assistant. In 1951, he was made Acting Cashier and confirmed in this post in the same year. Like several of our other employees, Ibrahim Kutty, also, came to us from the Fertilisers and Chemicals, Travancore, Limited, which company he joined as a clerk in 1947.



Ibrahim Kutty belongs to a respectable family of hereditary *Ayurvedic* doctors; his father who crossed the Psalmist's boundary-line of three-score-and-ten, ten years ago, is still going strong!

Ibrahim Kutty schooled in four places—Kuripuzha, Sasthanacottah, Quilon, and Alleppey. He received a particularly good grounding in commercial subjects.

Not robustly-built to look at, Ibrahim Kutty is nevertheless a passable enough footballer—they pass him



P. Sivasankaran Nair.

all right on the ground and a badminton player. He is a first-rate swimmer and little wonder too his home is in Kuripuzha on the shores of Lake Ashtamudi.

Ibrahim Kutty is particularly devoted to Malayalam literature, his favourite authors being N. Krishna Pillai, Thakazhi Sivasankara Pillai, and G. Sankara Kurup. A faithful and sincere friend, he is loved by every one in the company, and not simply because he holds its purse strings!

* * * * *

P. Sivasankaran Nair, Planning.

P. Sivasankaran Nair, Planning, has played the heroine, yes, heroine, in all our Malayalam plays. (At least, so far as the amateur stage is concerned, all women's parts are still largely played by boys in this part of the country, and it is not an uncommon sight, especially in college presentations, to come across "some squealing Cleopatra boy her greatness.")

About five years ago, Sivasankaran took his maiden bow in *Minnal Pranayam*, a sparkling Malayalam comedy, in the style and manner of Sheridan's *Rivals*, and since then he has not looked back. Neither have we!

Sivasankaran Nair has always had an artistic temperament. Even back in his school days, he was the editor

(Contd. on page 11)



K. Nanoo.

K. Nanoo, Gang Leader, Moving and Handling, Shipping.

Yet another Nanoo whom we would like to present in this issue belongs to Moving and Handling, Shipping. He has been with us since 1946. Prior to joining our works, he was with H. & C., Quilon, a tile factory, and an oil mill.

Nanoo started off with us on construction, and after production commenced, he moved over to Moving and Handling. In April 1954, he was named a gang leader.

A willing worker and an able hand, Nanoo's deftness in the handling of materials is particularly noticeable when the going is rather heavy.

Nanoo is the father of one girl and five boys—two of whom N. Gopalan and N. Veloo are working for us—the first in the Maintenance Section and the second in Shipping.

(Contd. from page 10)

of a manuscript magazine called *Kerali*. He has often helped the editor of this journal with well-written reports of our various functions. Photography is another of his interests, and several pictures that the CHRONICLE has used are all his work. In the staging of children's Fancy Dress competitions, Sivasankaran has always lent a helping hand.

Sivasankaran Nair joined us in 1950, after his E.S.L.C. Quite devoted to his work, and good at it, urbane and sweet-tempered, he is equally well-liked by those in his own section, and by friends in other sections.

Our Mechanical Foreman



V. PARAMOO.

BACK in the war years (1939-42) in the noisy mansion, where the masters taught their little school at Kottarakara, at least one boy who was one of the "big noises" was paradoxically enough a quiet lad; he had his weather eye open for his progress card, and was concentrating all the time on being the top boy of his class. Small wonder, the Headmaster and other teachers of this school gave the boy a good *chit*.

Now, he is with us... as our Mechanical Foreman. Paramoo is a genial, human—no "mechanical" person—with wavy hair and winsome ways.

After his High school, Paramoo joined the CNT Institute, Madras, from where he obtained his LME diploma.

Directly he came out of the Institute, he found employment as a Supervisor with the Southern (then South Indian) Railway at Trichinopoly; he was engaged in a temporary establishment turning out hollow cement concrete blocks.

After a service of a year-and-a-half with the Railway, he left it to find an appointment as a Supervisor, again, with the Fertilisers and Chemicals, Travancore, Limited, Alwaye. Service with this Company lasted for a little under a year.

Paramoo then came over to Harrison & Crosfield, Quilon, as the Mechanical Foreman of their Saw Mills Department.

It was, then, that is, after two years and six months with H. & C., Kundara beckoned to him, and he joined our company in 1950, as a Cable Mill Supervisor; later, he was redesignated Maintenance Supervisor. Now, the Foreman in charge of Mechanical Maintenance and the machine shop, he has contributed not a little to our expansion programme—and to the efficient maintenance—of our works.

Games which interest Paramoo are Table Tennis, Volleyball, Caroms and Ring Tennis, but his real interest lies in the reading of books of all kinds—engineering, scientific and philosophical.

His motto? Work—work—work, till the brain begins to swim; work—work—work till the eyes are heavy and dim.

Sweet and amiable of disposition, Paramoo can get along with his men remarkably well. Which is as it should be with a foreman, even a "mechanical" foreman, as men come first, and machines take only a back seat.

Ayudha Puja Festival

—o—

Two days of poetry, music & dance

MUSIC, Kathakali, Bhagavatha Parayanam an Akshara Sloka contest, a poet's symposium, a play, and then, what-have-you characterised the two days of Ayudha Puja celebrations of 1955. The more important day was, of course, the first day—October 25, the actual day of worship; October 26 was the *punar puja* day.



An artistic, little, *mandap* had, as in previous years, been got ready over-night, the machines having been given a holiday at the stroke of 12. (If flippancy is permissible in telling the story of a religious festival, *Ayudha Puja* is essentially an "All Tools' Day"!) Decorated with buntings and bulbs of varied hues, the *mandap* did have the earmarks of a small temple. Installed in it was a beautiful picture of *Saraswati*, the patron goddess of knowledge and learning. Perhaps, the trappings and the paraphernalia that we had used were right, perhaps, we had the right kind of audience, but, by God, we did have "atmosphere" at the time of worship; it was appropriately solemn, and we watched the *puja* ceremonies in a devout, prayerful mood.

In the evening, Srimathi Shantha P. Nair treated a large audience to a regular feast of music. As the fare she offered consisted of both light and popular items as well as classical, high-brow stuff, the palate of the dilettante was properly tickled and the vanity of the virtuoso was also properly tittivated, or so we concluded.

And, then, at 10 in the night we had a dramatic performance. A professional troupe put on boards *Taj Mahal*, a great stage success in these parts, and we thoroughly enjoyed it.

On October 26, the first thing we did in the morning was the *punar puja* ceremony; ancillary to it were a *Bhagavatha Parayanam* by Perayam Gopala Pillai and Kallada Madhavan Asan, and an *Ashta Padi* recitation by Sankararama Iyer and Idakka Marrar.

At 3 p.m., we had the usual *Akshara Sloka* contest in which at least seven participated. K. P. P. Kartha (Planning) and N. Neelakanta Iyer (Bills) were the winner and runner-up respectively.

At 4 p.m. we had a meeting with Mr. K. Gopala Pillai, Editor of the *Malayala Rajyam*, in the chair. Mr. Gopala Pillai's was a great address on "Great Literature and Great Authors". Other speakers on the occasion were Mr. P. G. Yohannan, Mr. Paramoo and Dr. E. K. Raman Pillai. Earlier, we had a "Poets' Symposium", the poems of K. Krishnan and P. Siva-

sankaran Nair being the two prize-winning entries.

Suggestion awards (see page 25) were also given away at this session.

Late in the evening, we had a *Hari-katha Kalakshepam* by Srimathi S. R. Pankajam of Mavellikkara, and at 10 p.m. *kathakali*, the *piece-de-resistance* of the celebrations. The pieces performed were *Lavanasura Vadham* and *Duryodhana Vadham*. All the "big four" of the art were there; Kurichi Kunjan Panikker, Mankulam Vishnu Namboodhiri, Kalamandalam Krishnan Nair and Kudamaloor Karunakaran Nair.

It would be an impertinence even to attempt an assessment of the merits of a show put over by such a cast as this; the names themselves should do all the talking.

Among guests who enjoyed the show were Mr. S. Bhattacharya of Damodar Valley Corporation and Mr. H. K. Ramaswami from South Madras Electric Supply Corporation, Tiruchirappalli. *The customer is always right!*

On facing Page :

(1) The mandap with a picture of Saraswati, the goddess of learning, installed in it. (2) Music recital by Srimathi Shanta P. Nair (3) In addition to the two main pieces, *Lavanasura Vadham* and *Duryodhana Vadham* the Kathakali artistes staged a light piece from the *Uttara Ramayana*. In this story, a washerman suspects the

fidelity of his wife after she had spent a short period elsewhere, and rejects her. Picture shows a scene from this story—the washerman tense and thoroughly worked up, and his wife looking a perfect picture of misery. (4) A dramatic moment from *Duryodhana Vadham*. (5) The Kathakali troupe : From L to R they are Chenganoor Raman Pillai, Unnithan and

Kalamandalam Krishnan Nair with Dr. E. K. Raman Pillai, Mr. K. Gopala Pillai Editor, *Malayala Rajyam*, Mr. V. G. G. Nayar, Mr. B. V. D. Menon, Mr. H. K. Ramaswami of South Madras Electric Supply Corporation Ltd., Tiruchi, and Mr. S. Bhattacharya, Project Engineer, Damodar Valley Corporation. (6) A tender moment from the play, *Taj Mahal*.



SOCIAL WELFARE PROJECT

ON September 30, 1955, Mrs. Indira Gandhi, daughter of Prime Minister Nehru, took time off for a visit to Kundara—it was really kind of her to have included this visit in her itinerary of the T.-C. State.

At a meeting held in the afternoon, Mrs. Vijaya G. Nayar, Convener, handed over to Mrs. Indira Gandhi a cash gift of Rs. 500 and cloth worth approximately Rs. 600. Acknow-

ledging the gifts, Mrs. Gandhi said that she was delighted to note the progress achieved in social welfare work by the women of the State in general and by those of that locality in particular.

Gandhi Jayanti: The Project celebrated Gandhi Jayanti in a fitting and solemn manner. *Bhajans* were sung and a discourse on Gandhiji's life and teachings was given by Sri-mathi Thankamma Malik.



Mr. C. G. Gorton and
M. P. M. Pillai, our Bombay
Representative.

IN November last, Mr. C. G. Gorton, our Representative in England, came to India on a hurried and all-too-brief visit. He wanted to get back home for Christmas, so we could not press him to stay longer than he could actually manage. He is, however, visiting us again soon on an extended sojourn. Needless to say, we are looking forward to his visit with pleasurable interest.

* * * * *

Left top: Mrs. Indira Gandhi with Mrs. Vijaya G. Nayar. Mr. V. G. G. Nayar can also be seen in the picture, first from left.

The poet cornered!

J. FRANK MORRIS, the author of the sonnet on page 15 heads our Civil Engineering Section. A graduate of the Madras University and an Associate Member of the Institution of Structural Engineers, London, engineering is but one of his varied interests. For instance, mathematics, history and literature, especially English poetry, are other subjects in which he has an abiding interest. He has drunk deep of the Pierrian spring, his favourite poets being Byron, Browning, Rupert Brooke, Alice Meynell and Francis Thompson.

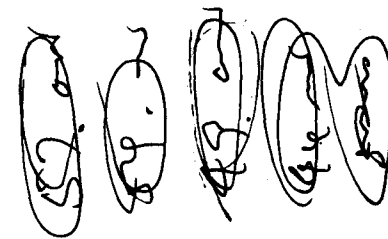
Mr. Morris comes to us after a service of many years with the Public Works Department. Several new

construction jobs have been undertaken—and some already completed—since he accepted an appointment with us. He is looking forward with the keenest interest to the completion of our new administrative offices, a three-storeyed affair, streamlined and fitted with all modern conveniences—to borrow a phrase from hotel ads. In other words, the poet is going to give to an airy nothing a local habitation and a name!

A quiet and somewhat reserved type, Morris may at times be even mistaken for an insufferable, stiffish sort, but beneath his apparently brusque exterior he hides a heart of pure gold... or should we say conductor-grade aluminium, seeing how dear the light metal is to him... and to us!



J. F. Morris.



On ALIND!

Aeons ago when creation's mighty wave,
Swept over the boundless voids, and the earth,
And the myriad stars of heaven took their birth,
The Hand of the Mighty, the earth's crust did pave,
With glistening globlets of sparkling beauty.
Tarnished, in dust long did they lie,
Until Humphry's discerning eye did spy,
The beauteous metal Al. of varied duty.
Rare it remained in our land, and still rare,
Until on the shores of that multi-armed lake,
Three gifted sons of Bharat, with toilsome care,
The wondrous ALIND famed of many lands, did make,
To gird the land with beneficent power,
From pole to pole and tower to tower.

J. FRANK MORRIS.



“On Earth Good will Yuletide Season brought and laughter to

THIS year again the company was *en fete* to the children of the colony during Christmas week. The venue of the jollifications was V. G. G. Nayar's residence, and although it was six days since Christmas had passed us by, Santa Cl (very ably played by Tom Levario) made a special effort and kept his date...or did he?

(1) Mehr, daughter of P. A. Ibrahim, Personnel Officer, receiving a Christmas gift from Santa Claus.

(2) Tulasi, daughter of Pappu Pillai, Reel Packing, walking away with her Christmas present.

(3) John Panicker, First prize-winner in the Baby Show, Group I.

(4) Jaya, daughter of Mr. T. A. Viswanatha Iyer, receiving a prize for Candle Race from Rev. Fr. Cameons, the Parish Priest.

(5) Gracy Ninan, the little sister of N. Thomas Panicker, Cable Mill, a prize-winner in the Baby Show (Group II).

(6) T. Levario as Santa Claus.

(7) Rev. Fr. Cameons handing the first prize in the Children's Fancy Dress Competition to Kannan, son of Mr. V. G. G. Nayar.

(8) V. D'Cruz, Electrical Section, and his band of musicians.

Peace, towards men” brightness to young eyes young hearts

The genus was children, the species infants and juniors and the varieties boys and girls, but we suffered them all to come unto us and forbade them not and arranged for them eats and games.

(1) “Saramma” going to Church—Baghyam daughter of K. R. Sankaranarayanan, Secretary.

(2) Harijan girl with a bundle of green grass—Leelakumari, daughter of K. Chellappan Pillai, Mech. Maintenance.

(3) ALIND Cable Drum—only the reel was first seen moving, then the boy Jibbu, son of M. K. Varughese, Production Foreman, emerged.

(4) Gipsy girl—Mohammed Ali, nephew of P. A. Ibrahim, Personnel Officer.

(5) Beggar with crutches—Vijayan, son of S. Damodaran, Registered Office.

(6) Railway Guard—Kannan, son of V. G. G. Nayar, General Manager (1st prize-winner).

(7) “Sridevi” going to temple—Molly, daughter of M. K. Varughese.

(8) Fortune-teller—Gopi, son of P. N. Velu Pillai, formerly of Stores.

(9) Postman—Lala Varughese, son of M. K. Varughese.

(10) “Man-Monkey”—Lala Thomas, son of K. K. Thomas, Chargeman, Cable Mill.

(11) and (14) P. Sivasankaran Nair, Planning, and K. S. Kalyanakrishnan, Inspector, Quality Control—the two make-up “wizards”.

(12) “Collector” wastepaper, cans and bottles—Koshy, son of M. P. Mamman, Chargeman, Inspection.

(13) “Balloonwala”—Prasanna Kumar, nephew of V. Paramoo, Mechanical Foreman.





There were separate sports items for boys, separate sports items for girls and a few items in which the two genders freely mixed. For the infants the two exciting items were running race and picking the sweets. A not-to-be-forgotten sight this running race tiny tots working their tinier legs as fast as their little bodies would urge them. For the higher age group, too, we had a running race, besides events like biting the buns, candle race and an egg and spoon race. For the distaff side, there were: threading the needle, picking the biscuits, running and candle races. The combined items were musical chairs, memory testing, pig-tail touching and tug-of-war. The last item provided an object lesson in the battle of the sexes, the so-called weaker sex pulling a fast one on the much advertised, stronger sex!

In the evening, the children and their parents re-assembled on the gaily-decorated grounds. First, there was a baby show, the children being divided into two categories, "those who quietly sucked their thumbs and those whose teeth were tucking out of their gums" in other words, the under-two-years, and the between two-and-four years. Fourteen in group I and twenty in group II were presented to the

judges who were: Dr. E. K. Raman Pillai, Dr. S. D. Edwards, Dr. Sumitra, Rev. Fr. Cameons and Mr. S. Narayana Pillai, Advocate, Quilon. The judges thought that the standard of health shown by the babies was remarkably good. Silver articles were given away as prizes to both groups, the winners being:

Group I. John Panicker and Johnson Joseph, and,

Group II. —Gracy Ninan, Shyamala, Master Johnson, Mehr and Roy.

Following the baby show was a children's fancy dress competition which surpassed, if possible, even the very high standard of make-up already established for this event in the colony. The pretenders on parade included a railway guard, dressed in a little brief authority, a postman, Saramma going to Church, Sridevi going to temple, and a man-monkey playing such fantastic tricks as made the audience weep for very joy. The railway guard, portrayed by Kannan, son of V. G. G. Nayar, and the man-monkey portrayed by Lala Thomas, son of K. K. Thomas, were declared I and II prize-winners by a panel of judges consisting of Mr. S. Peer Mohammed, Works Manager, Electrical and Allied Industries (Trav.) Limited, Kundara, Mr. E. U. Mathew,

Executive Engineer, State Electricity Department, Quilon, and Mr. G. Sadasivan Nair, Advocate, Quilon.

Twilight came, and with it also Santa Claus, (*alias* Tom Levario) in his legendary red gown and white beard, accompanied by a band of musicians and melody-makers. He drove round the grounds twice and finally took his seat near the illuminated, present-bedecked Christmas tree, the festooned fairy lights and the bunched balloons above and various other decorative effects supplying the necessary seasonable, carnival touch. Levario, sorry, Father Christmas, then handed out a present to each child from the large Christmas tree; he had, also, a word or two for the children. The gifts included such articles as dolls, bunnies, pop-guns and mechanical toys.

"It is good to be children sometimes," as Dickens observed long ago, "and never better than at Christmas when its mighty Founder was a child himself".

Well, everyone agreed that the party was a great success; that it was so was due to our many members who could always be relied upon to lend a helping hand. Our thanks are due to all of them who so kindly gave of their time and talent and particularly to J. F. Morris, our convener.

On facing page:

- (1) Pig-tail touching.
- (2) Biting the bun.
- (3) Candle Race for boys.
- (4) Candle Race for girls.

(5) and (7) Tug-of war:
The girls beat the boys.

(6) The Baby Show:
J. F. Morris holding the baby with the judges looking on! (*from left to right*): Dr. E. K. Raman Pillai (back

to the camera), Dr. S. D. Edwards and Rev. Fr. Cameons.

(8) Picking the biscuits—an event for the girls.

(9) Egg-and-Spoon race—an event for the boys.

ANOMALIES IN IMPORT DUTIES

I. E. M. A. Chairman's plea at Annual Meeting

"AN increase in production, such as the successive Five-Year Plans of this country demand, must mean the development of greater strength of associations such as greater co-operation with all Government Departments," declared Mr. A. R. Driessen, Chairman, Indian Electrical Manufacturers' Association, at its Eighth Annual General Meeting held in Bombay on February 19, 1956. A large and representative gathering was present.

Referring to the establishment of the Development Councils for electrical industries early in 1955, Mr. Driessen said that the industry had hailed the move as a great step in providing a common meeting ground for representatives of manufacturers, customers and labour.

As an association of Manufacturers, IEMA would have very much liked to be represented on the Council for the Heavy Electrical Industries, he said, "but it has been ignored for reasons best known to Government. Any way I am glad that at least representatives of all the important industries—namely, electric motor, transformer and cables and wires are on the Development Council".

On opposite page:

(1) Dr. V. Y. Novotny, Dy. Trade Commissioner, Representation of the Czechoslovak Republic, Bombay and Mr. O. Fiala of Metalimex Praha, Czechoslovakia.

(2) Students of the College of Engineering, Trivandrum, with Mr. M. V. Kesava Rao, Principal, in the foreground.

(3) Mr. P. A. Krishnan, Superintending Engineer, Technical (Electrical), Madras Electricity Department (in white coat) with V. G. G. Nayar and others.

Referring to anomalies in import duties Mr. Driessen said, "Although many representations have been made to Government by individual manufacturers and by this Association in respect of anomalies that exist in the import duties on aluminium bars and rods, this matter has not received the urgent attention that it merits, and I would like to take this opportunity of once more pointing out that the adjustment of the import duties on aluminium bars and rods which took place on 1st September 1954 stipulated that aluminium thus imported might only be used for the manufacture of ACSRS. This unfortunately does not take into account that all-aluminium conductors under item 72 (e) of the I.T.C. allows finished foreign all-aluminium conductors to be imported into this country at the rate of duty of 5½ per cent. It will be apparent that as long as foreign all-aluminium conductors can be imported at the rate of duty of 5½ per cent the indigenous manufacturer of overhead conductors cannot compete since he is obliged to pay a duty of 31½ per cent if the metal is imported for this purpose. May I, therefore, once again plead that this matter should be investigated with all speed and that the import of foreign all-aluminium conductors of 5½ per cent duty should be stopped, and

aluminium imported under existing import duties be available for the manufacture of all-aluminium conductors also?"

Touching on the aluminium supply position the Chairman observed: "Aluminium, today, whether in the form of ingot, bar or rod, is almost unobtainable in foreign markets and the principal suppliers to this country, the Aluminium Union of Canada, by virtue of the shortage of metal, are only able to allocate to indigenous manufacturers of overhead conductors quantities based on a quarterly quota which is entirely insufficient to meet the country's needs and their plans of expanding the distribution of electrical energy".

Concluding, the I.E.M.A. Chairman said: "The progress of civilisation, as we know it, has been divided into the Stone Age, the Bronze Age, etc., and I think it would not be inappropriate to describe the present era as the Scientific Age. Industry in any country is the single greatest user of scientific knowledge and, as the frontiers of scientific knowledge extend, it is imperative that the Government and the members of this Association should keep pace with all scientific and technological developments in order to ensure the progress of the Indian nation and the industries this Association represents, as well as the continuity of employment for those engaged in its activities. Let us then keep this aim in view and endeavour to achieve by helpful co-operation with Government, and amongst ourselves those results which must lead us to the goal that we are endeavouring to achieve."

(4) (i) Mr. P. S. Rau, Chairman, DVC, with V. G. G. Nayar and K. Ramakrishnan Nair. (ii) Mr. S. S. Narayan, Mr. Robert E. Young and Mr. P. N. Krishna Pillai of the Indian Aluminium Company Limited.

(5) Mr. R. S. Wagenet, Industrial Relations Adviser, T.C.M. U. S. Embassy, Mr. A. Mathew, State Boiler Inspector, Mrs. Gupta, Mrs. Wagenet, Mr. M. N. Gupta, Dy. Chief Adviser of Factories and Mr. P. Seetharama Kukiliya,

Chief Inspector of Factories and Boilers, Travancore-Cochin, Mr. Mathew Chacko, Inspector of Factories and Mr. A. A. Abraham, Divisional Inspector of Factories and Boilers, with P. A. Ibrahim, Personnel Officer.

(6) Mr. J. M. Lalwani and Mr. E. U. Mathew, Executive Engineer, State Electricity Department.

(7) A group photo of Inspectors of Factories and Boilers with members of our staff.

WELCOME VISITORS

IN recent months we had the pleasure of welcoming to our works several distinguished visitors. We are grateful to them for the honour they have done us, and we do hope that it will be possible for them to come to us again and yet again.

On October 23, 1955, Mr. P. S. Rau, I.C.S., Chairman, Damodar Valley Corporation, paid us the honour of a visit. V. G. G. Nayar, General Manager, showed him round the works.

Mr. Rau showed great interest in our rolling and multi-strand cable making operations—at the time of his visit an order of 1,000 miles of "LARK" ACSRS was going through our machines. While at lunch with members of our supervisory personnel, he was told all about our quality control measures.

On December 12, 1955, we were delighted to receive Mr. P. A. Krishnan, Superintending Engineer, Technical (Electrical), Madras Electricity Department. He addressed a meeting of our supervisory staff, at which he stressed the important role of the cable making industry in the electrification plans of the country.

Mr. Krishnan left a very fine tribute, indeed, in our Visitor's Book. Wrote he: "A very successful enterprise run on very sound and rational and progressive lines on a 'family' footing."

Other visitors included:

(1) Mr. C. V. Kamath, Inspector of Boilers, Andhra; (2) Mr. S. S. Banerjee, Chief Inspector of Boilers, Assam; (3) Mr. S. C. Roy, Chief Inspector of Boilers, West Bengal; (4) Mr. H. G. Chaoji, Chief Inspector of Boilers, Madhya Pradesh; (5) Mr. S. N. Mahalingam, Chief Inspector of Steam Boilers, Madras; (6) Mr. B. K. Patnaik, Inspector of Boilers, Punjab; (7) Mr. B. R. Mohindra, Chief Inspector of Boilers, Punjab; (8) Mr. R. P. Singh, Chief Inspector of Boilers, U.P.; (9) Mr. Medhi Ali Mirza, Chief Inspector of Factories and Boilers, Hyderabad; (10) Mr. Virendra Sahai Saxena, Chief Inspector of Boilers, Madhya Bharat; (11) Mr. M. R. Aswathanarayana Rao, Inspector of Factories and Boilers, Mysore; (12) Mr. Hans Raj Pabuwat, Chief Inspector of Factories and Boilers, Rajasthan; (13) Mr. P. Sitarama Kukilaya, Chief Inspector of Factories and Boilers, Travancore-Cochin; (14) Mr. A. M. Gavin, Chief Inspector of Boilers, Bihar; (15) Mr. S. N. Sen Gupta, Technical Adviser (Boilers) to the Government of India, Ministry of Works, Housing and Supply, New Delhi; (16) Mr. M. N. Kale, Under Secretary, Ministry of Works, Housing and Supply, New Delhi; (17) Mr. S. K. Nath, Assistant, Ministry of Works, Housing and Supply, New Delhi; (18) Mannath K. Padmanabhan, Changancherry; (19) Mr. V. K. Velappan, President, Nair Service Society; (20) Mr. M. R. G. Paniker, Registrar, Nair Service Society, Karayogams; (21) Mr. S. Balakrishnan Nair, President, Quilon Taluk Union, Nair Service Society; (22) Mr. N. Gopala Pillai, Municipal Commissioner, Quilon; (23) Dr. N. P. Panicker, Quilon; (24) Mr. J. M. Lalwani, The Western Manufacturing Co., Bombay; (25) Dr. V. Y. Novotny, Dy. Trade Commissioner, Trade Representation of the Czechoslovak Republic, Bombay; (26) Mr. O. Fiala of Metalimex, Praha; (27) Mr. M. V. Kesava Rao, Principal, College of Engineering, Trivandrum, and Students of the College; (28) Mr. S. S. Narayanan, Mr. Robert E. Young and Mr. P. N. Krishna Pillai of the Indian Aluminium Company; (29) Mr. R. S. Wagenet, Industrial Relations Officer, T. C. M., American Embassy and Mrs. Wagenet; (30) Mr. M. N. Gupta, Chief Adviser of Factories, and Mrs. Gupta; (31) Mr. A. A. Abraham, Div. Inspector of Factories and Boilers and (32) Mr. Mathew Chacko, Inspector of Factories.





REPUBLIC DAY... Club Day... and Ladies Club Day. We had a three-in-one slapper of a celebration this year on January 26.

The Republic Day part of the festivity was over in the forenoon. As in other years, the children of the colony first went round in a procession, carrying national flags and shouting slogans, the rear being brought up by a sizeable contingent of employees. On the grounds opposite to the garages, the usual venue, the procession stopped and V. G. G. Nayar, General Manager, unfurled the tri-colour to the strains of *Jana Gana Mana*.

Later, tiffin packets and milk were distributed to the children.

The joint function of the Alind Recreation Club and the Alind Ladies Club was held in the afternoon with Mr. K. P. Sreedharan Nair, Chief Engineer, of the State Electricity Department, as the chief guest.

Introducing Mr. Sreedharan Nair, Director B. V. D. Menon referred to 'the glory that was Mr. Sreedharan



Nair' in his college days. Mr. Menon said that Mr. Sreedharan Nair had been a wonderful athlete and a first-class footballer in his time. As a Government Director, as customer and as an outstanding sportsman, Mr. Sreedharan Nair had triple claims to their affection, he said, and was an extremely apt choice for a function such as theirs that day.

In the course of an interesting address, Mr. Sreedharan Nair said that for long he was undecided on the choice of a career: to be or not to be a professional footballer or an electrical engineer, that was the question. It was not without a wrench that he finally discarded the idea of turning a "pro," to become an engineer.

Continuing, Mr. Sreedharan Nair observed that club life helped to foster democratic ideals. A club was a "leveller" of rank, position and wealth, he said. He, for one, had always deprecated the idea of members standing up before superiors in clubs. Mr. Sreedharan Nair also declared that as a force for rounding off angularities, a club was unrivalled. It was in a club, he said, that one shed one's pet theories and prejudices—at least others would see to it that one did not for long remain crotchety or conceited.

Concluding, the speaker complimented the Alind Club on its excellent record of work and wished its members all success and happiness.

Mr. N. P. Chellappan Nair, Block Development Officer, and a noted author and short-story writer then spoke on "Art and Literature". Full of wise saws and modern instances, his speech produced a chuckle almost

every sentence. Mr. Chellappan Nair dwelt at length on the merits of *Kathakali*, the great dance drama of Kerala. This art-form, he said, had made the people of the land the inheritors of a fulfilled renown.

Prizes were then distributed by the chief guest to the successful participants in various events. Suggestion awards were also given away at this function. The occasion was also availed to install the new Secretary - M. R. G. Menon - in office and to make a presentation to M. K. Varughese, the out-going Secretary, as a token of appreciation of his meritorious services to the club for over three years. The presentation consisted of a length of shark-skin suiting and a document case. Varughese made an appropriate thanking speech.

Earlier, he presented the report for the year 1955.

Current membership strength stood as high as 268, his report revealed. (It was 113 at the beginning of the year.)

A notable feature of the year's activities was the holding of fortnightly meetings. At these meetings were thrashed all sorts and kinds of subjects, such as, for example: Atomic energy; Marriage laws and customs; India's status in the international world; Science and atheism; Writers and their obligations to the community; Women's education in the new set-up; Foreign investments in India; Is religion necessary for the continuance of human society?

Football, badminton, volleyball, ring tennis, table tennis, caroms and chess continued to be as popular as ever.

Basketball possibly tennis also might be offered to members in 1956.

A programme of varied entertainment was offered in the evening; it started off with a piece of mono-acting by Joseph Zacharias, Stores, and mimicry by M. P. Aravindakshan Nair, Planning. And then we had a dance recital by the members of the *Arya Kala Nilayam*, Meppay. Their repertoire included several popular numbers, and the one in which the Director himself took part, was particularly well-received.

The dance recital was followed by a deliberate apology of a music recital by some of our employees. The "artists" were: Quilon K. Seetharaman Baghavathar, (sic!) Vocal; T. K. Radhamonic, *Mridangam*; G. K. Warrior, *Violin*; K. N. Gopinathan Nair, *Morsing*; K. S. Kalyanakrishnan, *Ghatam*; and K. Ramarajan, *Tamboora*.

Heard melodies are sweet, but those unheard are sweeter, as Keats hastily amended! But, it can't, however, be gainsaid that we had a quarter hour of glorious fun, and while opinion might possibly be divided on the noises that proceeded from the podium, every one agreed that the music-makers looked an authentic enough bunch they had an unmistakable 'air' about them, even if they did not have any tone!

The item to end all items was a Malayalam play called *Puja* put on boards by Alinders. Rather a serious play, this, offering little or nothing by way of comic relief, if one ignored the clowning of Vclu, the servant, ably portrayed by Aravindakshan.

There are two brothers, the younger of whom is the villain. This younger brother, aided and abetted by his fiancée and her mother, plots the ruin of the elder brother, who is soon forced to quit his home and hearth, with wife and kid. The younger brother then stands for election and later falls ill. Blood transfusion is required to save his life and the elder brother very



generously obliges with his blood. And, as was only to be expected, at play's end, the brothers are reconciled, and the younger brother is properly contrite and all that.

THE CAST

C. S. Kaladaran Pillai - *Sudhakaram*.
N. N. Iyer - *Driver, Sepoy*.
C. G. Balakrishna Pillai - *Vipinan*.
T. Sukumaran Nair - *Ganesan*.
K. Prabhakaran Pillai - *Bhagavatar, Beggar*.

M. K. Varughese - *Doctor*.
M. P. Aravindakshan - *Vclu*.
V. Hariharan - *Constable*.
K. Kunjan Pillai - *Shyama*.
P. Sivasankaran Nair - *Lachmi*.
P. Rajagopalan - *Ellamma*.

It may be that some of us found the play too stodgy for our liking, but the acting throughout was of a high standard.

And we called it a day at 2 a.m. ... on January 27!

(1) On facing page:

V. G. G. Nayar, unfurling the national tri-colour.

(2) On this page—(Top right)

Mr. K. P. Sreedharan Nair delivering the Club Day address. To his left is Mr. N. P. Chellappan Nair and to his right are (1) Mr. V. G. G. Nayar and (2) Mr. B. V. D. Menon. (More pictures on next page.)



The outgoing and incoming Secretaries—
M. K. Varughese and M. R. G. Menon.



(1) Joseph Zacharias doing his mono-acting piece.

(2) (5) and (6) Scenes from the play Puja.

(3) K. P. Prabhakaran Kartha, as a Court Official in the play, Puja.

(4) The dance recital presented by the Ariya Kala Nilayam included a popular item in praise of Lord Krishna. Picture shows the Director

of the troupe, Mr. Ramakrishna Panicker in the role of Kaniyan and T. R. Oomana as the daughter of this character.

(7) The "mock" music recital: The "artistes" from left to right are T. K. Radhamonie (*Mridangam*), K. N. Gopinathan Nair (*Morsing*), K. Ramarajan (*Tamboora*), K. Seetharaman (*Vocal*), K. S. Kalyanakrishnan (*Ghatam*) and G. K. Warrior (*Violin*).

(8) The actors who took part in the play: *Sitting* (From L to R): P. Bhaskaran Nair, P. Rajagopalan, P. Sivasankaran Nair, M. K. Varughese and K. Kunjan Pillai. (*On ground*) Jayanti, daughter of K. Chellappan Pillai.

Standing (From L. to R.): M. P. Aravindakshan Nair, Director of the play, K. Shums, K. P. P. Kartha, C. S. Kaladharan Pillai, P. Sukumaran Nair, V. Hariharan, C. G. Balakrishnan Pillai and N. Neelakanta Iyer.

RECREATION CLUB DAY

PRIZE - WINNERS

Badminton : (Singles).

Winner - K. Bhaskaran Pillai.
Runner-up - P. Bhaskaran Nair.

Badminton : (Open Doubles).

Winners - K. Bhaskaran Pillai and M. Sreenivasan.

Runners-up - O. C. Chacko and N. N. Iyer.

Badminton : (By lots).

Winners - P. Bhaskaran Nair and C. G. Balakrishna Pillai.

Runners-up - K. Sitaraman and P. Rajagopalan.

Badminton : (Fives).

Winners -
C. G. Balakrishna Pillai,
C. G. Madhavan Pillai,
M. V. John,
M. K. Varghese and
K. Prabhakaran Pillai.

Runners-up

P. Bhaskaran Nair,
K. R. Sankaranarayanan,
P. Rajagopalan,
C. S. K. Pillai and
E. P. Radhakrishnan.

Volleyball : (Sevens).

Winners

P. A. Ibrahim,
C. S. K. Pillai,
K. Sitaraman,
V. Hariharan,
P. Sukumaran,
P. Rajagopalan and
K. Bhaskaran Pillai.

Runners-up

E. P. Radhakrishnan,
N. N. Iyer,
K. S. K. Krishnan,
M. Srinivasan,
T. V. Ramachandran,
K. R. Balakrishna Pillai and
M. K. Varughese.

Caroms : (Singles).

Winner - K. S. K. Krishnan.
Runner-up - M. V. John.

Caroms (Open Doubles).

Winners - K. Sitaraman and T. V. Ramachandran.

Runners-up - K. R. Sankaranarayanan and T. K. Radhamonie.

Caroms (By lots).

Winners - C. S. K. Pillai and O. C. Chacko.
Runners-up - N. N. Iyer and T. V. Ramachandran.

Table Tennis : (Singles).

Winner - K. R. Sankaranarayanan.
Runner-up - T. V. Ramachandran.

Table Tennis : (Open Doubles).

Winners - T. K. Radhamonie and P. R. C. Nair.

Caroms : (Open Doubles).

Winners - T. K. Radhamonie and P. R. C. Nair.

Runners-up - K. Sitaraman and K. S. K. Krishnan.

Ring Tennis : (Singles).

Winner - T. R. Raghunandan.
Runner-up - P. Bhaskaran Nair.

Ring Tennis : (Open Doubles).

Winners - T. R. Raghunandan and P. Sukumaran Nair.

Runner-up - N. N. Iyer and P. Bhaskaran Nair.

Ring Tennis : (Doubles by lots).

Winners - T. R. Raghunandan and P. R. C. Nair.

Runners-up - P. Sukumaran Nair and M. V. John.

SUGGESTION AWARDS

SINCE last FACTORY DAY (and up to January 26, 1956) no fewer than forty-four suggestions had been received, but unfortunately not all of them could qualify for awards. In fact, the company could accept only fifteen. The small number of accepted suggestions should not, however, deter the "thinkers". Indeed, if the proportion of accepted to unaccepted suggestions has any lesson, it is this—namely, that the company continues to be in the market for worthwhile suggestions.

Remember that it costs you nothing to proffer advice, but it costs the company something to accept it!

So, get those old grey cells cracking, give thy thoughts pen and ink and paper and reward is sure to come; money (at least a tenner!) and fame (through the columns of the CHRONICLE!)

Total no. of suggestions received so far	...	159
Total no. accepted	...	44
Award amount paid	...	Rs. 995

Now, meet some of the master-minds whose brainwaves cost the company the tidy sum of Rs. 285... they got their deserts on *Ayudha Puja* Day.

1. **K. Govinda Pillai**: Head Guard - Rs. 10. He had a suggestion to make about the provision of storage facilities near the jetty and boat-basin.

2. **K. Govinda Pillai**: Driver, received a tenner with a suggestion down his own street; this dealt with steps to be taken for ensuring free and unobstructed passage for trucks in the factory area.

3. **K. K. Thomas**: Chageman, Cable Mill, Rs. 10. "Before you reject certain things as scrap," he said, "please do have them inspected and certified—by competent officials."

4. **G. Vincent**: Apprentice, Cable Mill, Rs. 75. Vincent really had a very paying—or is it receiving—idea when

he suggested a revised method for rating the efficiency of the cable-mill crew. "Raise the minimum from 75 to 80 points," he said. "Over 80 points, pay Re. 1-4-0 each per day, and pay Rs. 15 per shift both to the operator and the helper for attaining 2,340 points per month or 90 points on an average per day".

5. **K. Bhaskara Pillai**: Skilled Helper, Laboratory, Rs. 10. He had a suggestion on how to recover and use copper from copper sulphate solution.

6. We lent our ears to **C. A. Antony**, Inspection Section, with a cash award of Rs. 25 thrown in, when he told us: "Provide a motor reel-winding for, and rewinding after repairs."

7. We also harked unto **N. Bhaskaran Nair**, Cable Mill, when he pleaded: "Let the voice of helpers be also heard at Production Consultative Councils". A tinner changed hands.

8. **K. R. Balakrishna Pillai**: Chargeman, Cable Mill: "Provide steel pay-off stands instead of wooden ones for spooling purposes", he said. The company accepted the suggestion and cheerfully paid him Rs. 25.

9. **N. J. Unnithan**, Guard, Rs. 10. "To prevent possible fire hazards provide hydrants in the factory area; to prevent sickness and ill-health of employees, spray DDT in all living quarters every month."

10. **K. S. K. Krishnan**, Chargeman, Inspection, brought off a hat-trick with three winning suggestions. Each brought him a tinner apiece. "Provide steel and wooden racks near stranders for keeping lay gear after section changing, etc." he said first. We don't know if money talks, but it made Kalyan Krishnan think. He followed up with another suggestion which had something to do with the provision of separate rest rooms and enclosures. The third one to emanate from his prolific brain was, of all things on earth, a new advertising design!

11. **T. V. Antony**, Reel Shop. The company was most pleased to accept his suggestion for turning unserviceable files in the tool crib into serviceable tools. The award made to him was Rs. 50.

12. **N. N. Unnithan**: Guard, Watch and Ward, got way with another suggestion which meant another tinner. This time it related to the provision of a suitable gate at the entrance by the canal.

13. **A. Shahudeenkutty**: Cable Mill, Rs. 10. His suggestion related to the overcoming of bottlenecks in production now caused by loss of tags on steel spools containing core-wire.

A summary of suggestions accepted since January 26 is:

Received 15.

Accepted 7.

Award amount -Rs. 110.

K. Kunjan Pillai, Clerk, Stores, Rs. 10. "Provide a letter box for Works Staff".

Thomas Kurian, Chargeman, Machine Shop, Rs. 10: "To keep the line shafts of stranders smooth, and in position, he suggested, that a leather ring be provided.

P. N. Sivasankara Pillai, Mech. Maintenance, Rs. 10: "Lay pipe lines from the overhead tanks back to the well," he said, "then, the excess water from the tanks need not go to waste."

Joseph Zacharias, Junior Clerk, Stores, Rs. 20: He had some useful things to say on the reorganisation of store-keeping.

N. Gopalan, Mech. Maintenance, Rs. 10: "The two rounded surfaces of bushes of stranders could be cut or flattened and made more usable", he said. We bowed.

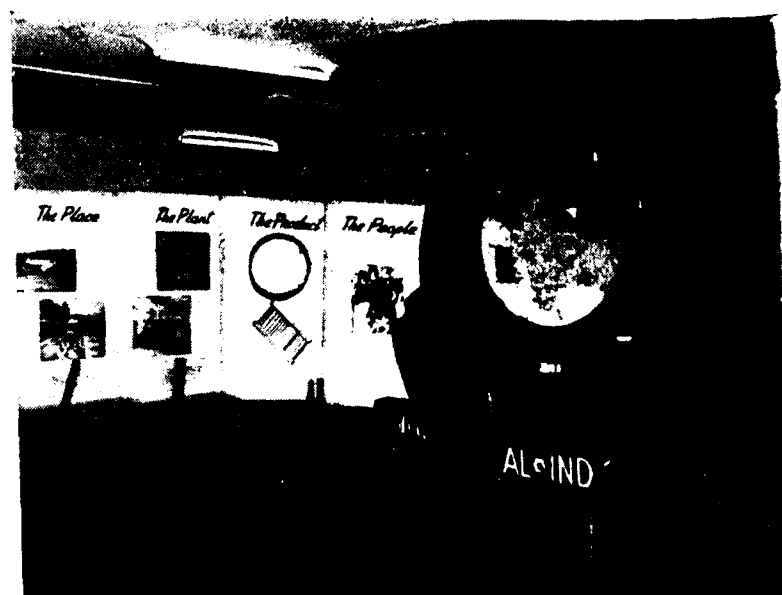
P. Rajagopal, Machine Shop, qualified for an award of Rs. 45 with two useful suggestions. The first related to an improved method for locking spool shaft and housing key shaft assembly on spooling machines; the second was the provision of a counter on travel-cut machine so as to record correctly quantities of rod produced.

Engineering Exhibition, Vizag.

IN August 1955, we participated in the Engineering Exhibition held at Vizag in connection with the formal opening of the Machkund Project by President Rajendra Prasad. As readers of this journal are aware, the Andhra Electricity Department is an esteemed customer of this company.



One of our stands at the Vizag Engineering Exhibition.



On opposite page: The ALIND exhibit in the Indian Industries Fair. Pictures 1 and 2 are two of the stands in our stall: (3) Mr. Bakshi Gulam Mohammed, Kashmir's Chief Minister, at our stall.



THE Indian Industries Fair, which was inaugurated by Prime Minister Jawaharlal Nehru on October 23, 1955, and which closed on January 1, 1956 was the biggest ever to be held in this country, or for that matter, anywhere in Asia. Occupying a 73-acre site and providing an exhibition space of a million square feet, the Fair showed what India could make, and what the country needed by way of capital equipment.

The Government of India was one of the biggest participants in the Fair, with pavilions and stalls from practically all the Ministries. Chief among them was the Ministry of Irrigation and Power which had on display a model of the Bhakra-Nangal Project, one of the biggest achievements of free India.

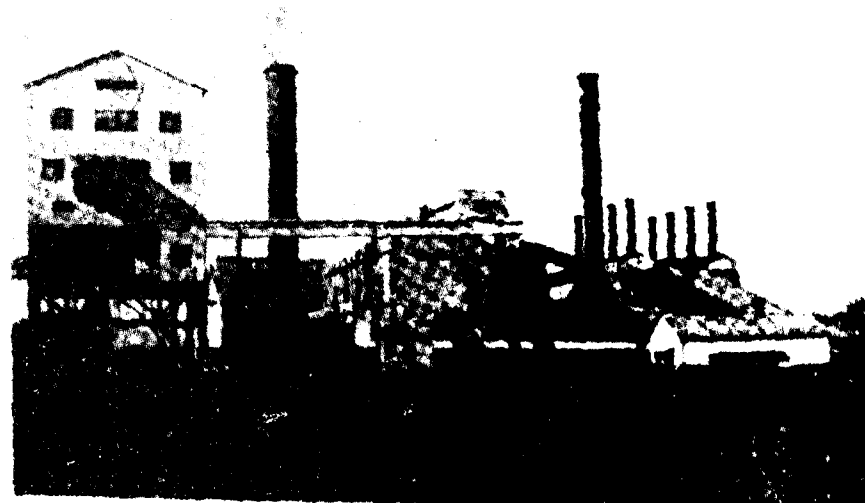
Also as many as twenty-one foreign countries participated. The foreign section was, in the main, a show-window of what the other countries could offer India by way of capital goods and equipment. But this section also contained items of interest for the common man for instance, the atomic reactor installed in the U.S. pavilion brought the highly technical subject of atomic science within practically everyone's grasp. Again, thousands of people had the opportunity of getting to know TV at first hand.

Indian industry large-scale as well as small-scale was, of course, there. This section bore impressive evidence to the vast range of products now being made in the country.

ALIND was there in this section, occupying a modest area of 1,250 square feet. The ALIND Exhibit told the story of the company in pictures and words mounted on large display stands. It included, among other things, an animated flow-sheet showing how ALIND cable was made, a model of a stranding machine, an illuminated map of India carrying colour transparencies of an electrical interest and samples of the various sizes of cables and the accessories that we make.

At our pavilion, we had the pleasure of greeting large crowds of visitors, and among them scores of engineers of electrical authorities who are using our products. Members of Parliament, Union and State Ministers.

Our Friend, THE CUSTOMER



Chola Power Station: (Board's Section is on the left.)

THE BOMBAY ELECTRICITY BOARD

THE customer whom it is our privilege to present in this issue of the CHRONICLE is the Bombay Electricity Board. And if you want to get the "hang" of this story with a topical peg, we are readily provided with one, as only recently the Board released its first Annual Report. More about it anon.

GENESIS

The "background" for the formation of the Board lies in the Statement of Objects and Reasons governing the Electricity (Supply) Act, 1948. One of the objects of the Act was the rationalisation of the production and supply of electricity and the adoption of measures conducive to the electrical development of India and on matters incidental thereto. The end in view of the sponsors of the Bill was the co-ordinated development of electricity in India on a regional basis.

The Bombay Electricity Board was constituted on November 6, 1954 consisting of:

Mr. M. H. Hasham Premji
Chairman.

Mr. Pestonji C. Hansotia
Member.

The Chief Engineer, Bombay Electric Grid—Member (Ex-Officio).

In February last, Mr. U. N. Mahida, Chief Engineer, Public Works Department (Irrigation) and Joint Secretary to the Government of Bombay was appointed a member, and in November, Mr. J. D. Kapadia, Development Secretary, was also taken in as another Member. The present Chief Engineer is Mr. V. R. Vaidya—he assumed office in December 1955. (He is also Chief Engineer to the Koyna Project.)

Mr. G. V. Bedekar, I.C.S., is the Honorary Secretary of the Board.

Prior to the formation of the Board, the electrical authority in the State was the Government Electric Grid Department which was created in March 1944. In 1946, Government announced a scheme for the development of electric supply in the Province involving the "establishment of an Electric Grid System in the regions which lend themselves to such development economically under quasi-State control and bringing the energy within reach of a progressively increasing number of urban and rural population".

As stated earlier, the Electric Grid Department, Government of Bombay, was the predecessor authority to the Board. A brief review of the achievements and accomplishments of the Board since its formation is contained in the publication "Administration Report 1954-55, Bombay Electricity Board."

This report covers the activities of the Board from the date it took charge of the Grid Department namely, from 6th November 1954 up to 31st March 1955, and also includes the activities of the Department from 1st April 1954 to 5th November 1954. The statements of Revenue and Expenditure for 1954-55 (actuals) and for 1955-56 (estimated) contained in the Report disclose deficits respectively of Rs. 26,05,674 and Rs. 23,18,388, but in defence of the Board it must be mentioned that it has incurred a capital expenditure of Rs. 91,20,036 in 1954-55 and expects to spend under the capital head another Rs. 2,87,65,371- in 1955-56.

The Board took over from the former Electric Grid Department 30 schemes and with four schemes (namely,

the undertakings at Hubli, Bhargar, Phaltan and Uhasnagar) formerly under the control of the Electrical Engineer to Government also taken over, it had 34 schemes in operation at the end of the year under review. To execute and to put into commercial operation all these schemes, the Board will have to spend a sum of Rs. 1654.65 lakhs excluding Rs. 51.18 lakhs being "valuation figures" in respect of schemes and power houses of the merged States.

PRODUCTION AND SALES

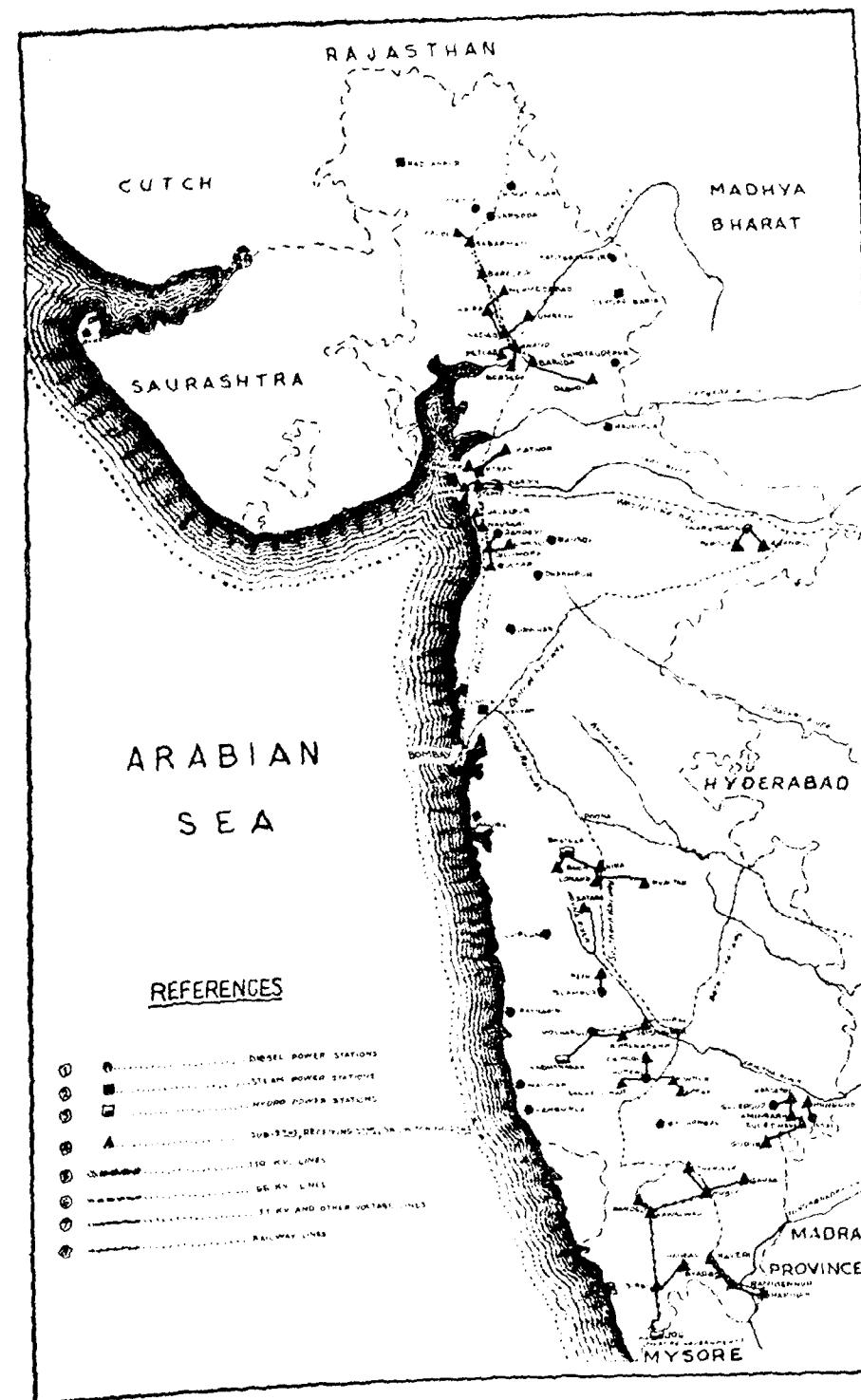
Particulars of the Board's electricity production and sales are as follows:—

Production

(i) Aggregate maximum demand	64,181 kW.
(ii) Generated and or purchased	kWh
Steam	189,468,925
Oil	6,164,274
Hydro	7,295,820
Purchased	81,781,824
Total	284,710,843

Sales kWh

1. Domestic	
(i) Heat and Power	229,451
(ii) Light and fans	3,841,990
2. Commercial light and small power	
(i) Heat and power	486,127
(ii) Light and fans	1,258,872
3. Industrial power	
(i) Low and medium voltage	3,180,773
(ii) High voltage	57,441,878
4. Street lighting	8,55,428
5. Agricultural de-watering and irrigation	2,649,802
6. Public Water works and sewage pumping	2,177,000
7. Supplies to military services	42,819
8. Supplies in bulk to licencees	187,342,509
Total Electricity Sale	259,506,649



TRANSMISSION

The total length of transmission lines is 873,717 circuit miles, the voltage breakdown being:

110 kV	109 Circuit miles*
66 ..	175
33 ..	85.25
22 ..	42.03
11 ..	462.437
Total	873.717

* Constructed but not commissioned.

The total length of distribution lines is 390,158 miles.

A glance at the map on this page will give some idea of the number and locations of the various power stations, substations and the transmission lines.

CONSUMERS

The consumers served, categories and connected load are as follows:—

	Number	Connected load kW.
1. Domestic		
(i) Heat and Power	217	225
(ii) Lights and fans	14,121	5,507
2. Commercial light and small power		
(i) Heat and power	262	969
(ii) Light and fans	5,379	1,861
3. Industrial power		
(i) Low and medium voltage	538	4,222
(ii) High voltage	20	21,243
4. Street lighting	52	329
5. Irrigation and Agricultural dewatering.	143	2,183
6. Public water works and sewage pumping	22	1,039
7. Supplies to military services	1	8
8. Supplies in bulk to distributing licences	19	63,176*
Total	20,774	100,762

*Includes 36,100 kW demand of Chola which is inter-connected with Tata System and, therefore, the equivalent connected load cannot be shown.

PLANS FOR THE FUTURE

Under the First Five-Year Plan the following projects were taken up:—

1. North Gujarat Electric Grid Scheme.
2. South Gujarat Electric Grid Scheme.
3. Jog Karnatak Electric Grid Scheme.
4. Chola Power Station Scheme.
5. Radhanagiri Hydro Electric project.
6. Kolhapur Emergency Irrigation and City Conversion Schemes.
7. Nursery Scheme for establishment of diesel and thermal stations in towns and villages.

These projects are, according to the draft Plan, expected to add about 111,800 kW to the existing load available and the anticipated probable demands in 1956 and 1961 in the three regions of the State might be :



Mr. M. H. Hasham Premji.
(Chairman)



Mr. V. R. Vaidya.
(Chief Engineer)

Zone	Probable demand for power		Available power facility
	1956 mW	1961 mW	
1. Northern Zone	133	170	127 Ahmedabad 15 Urban
2. Central Zone :			
(i) Bombay-Poona	330	482	330
(ii) Rest	10	73	30
3. Southern Zone	5	27	1
Total	478	752	503

The projects proposed to be taken up under the Second Five-Year Plan include :

Name of project.	Rupees in crores.
1. North Gujarat Electric Grid Scheme Extensions	3.00
2. South Gujarat Electric Grid Scheme Extensions	4.00
3. Jog Karnatak Electric Grid Scheme Extensions	1.25
4. Nursery Schemes	0.5
Total	8.75

The economic difficulties inherent in supply to sparsely populated areas have probably influenced the decision to earmark only Rs. 50 lakhs to finance diesel nursery schemes during the Second Plan period. The area to be covered by the nursery schemes will comprise 11 villages with a total population of 1,20,000 encompassing an area of 110 sq. miles.

The Koyna Project originally taken up as a power project is now intended to be taken up as a multi-purpose project and a provision of Rs. 29 crores has been made in the Second Five-Year Plan for completion of Stage I of the Koyna Project with a power generation of 240,000 kW. A major portion of the work is expected to be completed by the middle of 1961.

IN BOMBAY STATE		
"ALIND" Cable Table		
Bombay Electricity Board		
Code word		Miles
Dog	...	484
Mink	...	185
Ferret	...	258
Weasel	...	195
Total	...	1,122
Tata Power Co.		
Lark 30 7/1151	...	170

With the completion of the schemes to be undertaken during the Second Five-Year Plan the per capita consumption of electricity is expected to increase as under :

1. Residential	4.85 units.
2. Commercial	3.64 "
3. Industrial	76.40 "
4. Public lighting	0.69 "
Total	85.58 units.

As the draft Plan has stressed, among other things, the need for increasing the outlay on multi-purpose projects, the State Government has requested the Planning Commission to include the Ukal multi-purpose project as an additional provision in the State Plan.

Of the hydro-electric potential of about 110 mW expected to be available at Ukal by 1966-67 the draft Plan anticipates the distribution of power as follows :

1. Ahmedabad Licencee. 20 mW.
2. North and South Gujarat Areas ... 50 mW.
3. Central Railways ... 5 mW.
(in return for the 5 mW proposed to be bought from the Railways at Nasik and Mammad from their proposed Igatpuri-Bhusaval sub-station).
4. East and West Khandesh ... 25 mW.
5. Transmission losses ... 10 mW.

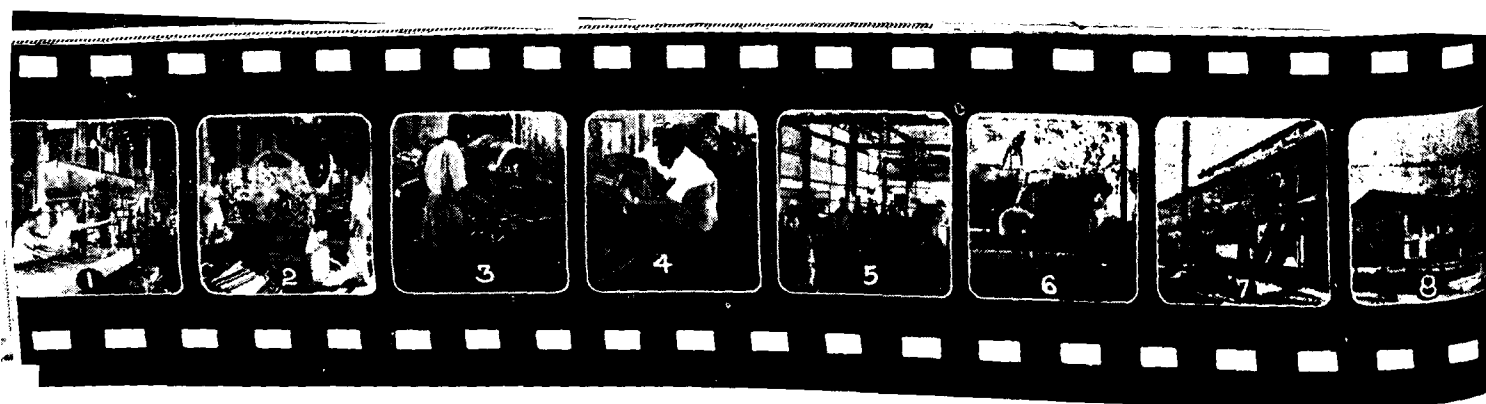
Total ... 110 mW.

The draft Plan also visualises investigation of the following projects:

1. Kalinidi Hydro-electric Project.
2. Bhandardara-Randha Hydro-Electric project.
3. Bhatgar Hydro-Electric project.
4. Narbada Hydro-Electric project.
5. Mahi River project at Kadana.

The draft Plan anticipates a total cost of Rs. 1 crore for investigation and survey of these projects, out of which a provision of Rs. 25 lakhs is proposed to be made in the Second Five-Year Plan.

In a foreword to the draft Plan, Bombay's Chief Minister, Shri Morarji R. Desai, has stated that the "schemes included in the Plan have been worked out in sufficient detail and can be implemented without loss of time". And we, for our part, would like to offer to the Board our very best wishes for the speedy and successful completion of the State's various electrification schemes.



MESSRS. Harrison & Crosfield, Limited, Quilon, are more than good neighbours to us ; they are our business friends too . . . on the right side, we being their customers ! Indeed, the neighbourly part, here (as with other neighbours we have dealt with in the past) is a point which has to be stretched somewhat, seeing that Quilon is a good eight miles off. But, as our readers know, or by now, ought to know, we use the term "neighbour" in a slightly Pickwickian sense !

The company set up its works as long ago as 1913, first on a small scale to cater to the needs of tea estates in

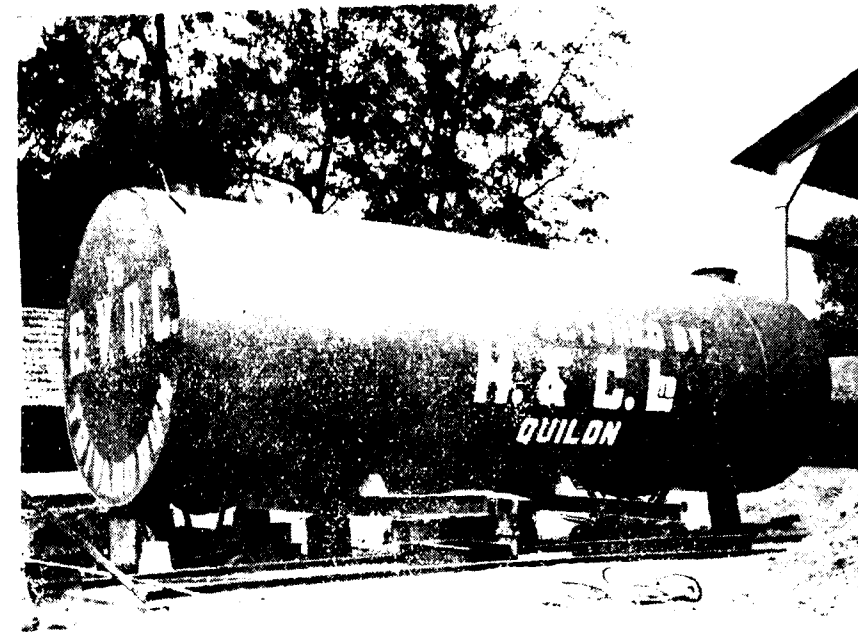
Engineers backed by support from a large drawing office and a good technical team.

Structural Work

The structural side of the works is principally engaged in producing steel-work for new factories, extensions to existing factories and storage tanks of all sizes up to 40,000 gallons. Arising directly out of the expansion schemes of the Five-Year Plan, the company has had to meet several large orders for transmission towers, substation structures, etc. The designs for these factories, structures, etc., are, for the most part, produced by the works drawing office.

- (1) Drilling a heavy steel beam before rivetting.
- (2) At work on a punching and shearing machine in the Structural Shop.
- (3) Machining a cast-iron V-Pulley on a lathe.
- (4) Motor rewinding in the Electrical Shop.
- (5) Work in progress in the Galvanizing Plant.
- (6) Oil tanks under manufacture in the Tank Shop.
- (7) The Hot-Dip Galvanizing Plant.
- (8) The Engineering Department Main Office.

A picture that speaks words ! A completed tanker for S.V.O.C. H. & C. make storage tanks of all sizes, up to 40,000 gallons.



Galvanising Plant

A recent addition to the works is the hot-dip galvanising plant ; it is housed in a large new building specially designed for it, where the pickling, washing, fluxing and galvanising tanks are laid out for flow production. This department also handles metal-spraying. A most fascinating process this, to watch. Even cardboards could be metal-sprayed, as Mr. Taylor demonstrated for our benefit.

The electrical section takes care of motor and dynamo repairs of all kinds ; it also undertakes the electrification of factories.

As stated earlier, behind these various departments, is a team of qualified personnel who assist customers in selecting the most suitable equipment or machinery for their needs, provide cost estimates, and supervise installations and initial operations.

Agency business

Harrisons, also, handle a large amount of business on an agency basis, the most important of which is the range of "Sirocco" tea machinery, manufactured by Messrs. Davidson & Co., Ltd., Belfast. They also represent the United Steel Co. (India) Ltd., makers of heavy equipment including steam locomotives ; Boving & Co.

Ltd., makers of water turbines, etc., the Paterson Engineering Co., makers of water filters and L.H.C. Holland, manufacturers of all types of dredging equipment.

Customers

Principal customers of the firm are the tea estates located throughout South India, but they have executed large orders for several industrial concerns. Good examples of such orders are the 'Titanium Products' factory at Trivandrum and our own rod-rolling plant at Kundara. The Madras and T.C. Government Electricity Departments are also large customers, particularly for transmission line towers and other ancillary items. Currently, the company is engaged in the erection of a substantial addition to the Punalur Paper Mills, Punalur.

Employee relations

Staff employed number around 450 including 35 paid apprentices who are of two categories—Engineering and Trade. The former are given training in all trades in addition to some training in the drawing office and are intended to become draughtsmen, rate-fixers, planners, etc. The training of these apprentices occupies three years, the minimum qualification for

being taken on as an apprentice being an E.S.L.C. or its equivalent. Trade apprentices are given two years trade training, and like the engineering apprentices, attend lectures given by a qualified engineer, twice a week. Both grades are required to undertake a year's journeymanship on completion of apprentice training. During the period of apprenticeship, visits are arranged to other engineering establishments. (Only recently, we had the pleasure of receiving one such batch at our works.)

It is certainly not all work and no play with Harrisons. They also run a flourishing "sports" department, called the Engineering Sports Club with a strength of 250. Some of the star footballers of the State belong to this club, and their Football Team is a regular participant in the Travancore-Cochin Football Association League tourneys. Other games in which members participate are badminton, volleyball and basketball.

Both as customers and good neighbours, we extend our very best wishes to Harrisons for success in their chosen field of engineering and on the sports field too—the name of the firm, as readers would have noted, contains a cross(s) field !

Our Neighbours

HARRISONS & CROSFIELD LIMITED, QUILON

general and to those of Malayalam Plantations, Limited, in particular—for whom Harrisons & Crosfield act as Agents.

Five main departments are comprised in the organisation : (1) Structural ; (2) Machine shop ; (3) Foundry ; (4) Galvanising Plant ; and (5) Electrical.

Headed by a Chief Engineer, at present Mr. J. M. Taylor, (whose hobby incidentally is sailing) the various departments are staffed by a qualified team of European and Indian

Due to insufficiency in the supply of indigenous steel, large quantities of foreign steel are imported for the works. In fact, your Editor saw in the yards Russian steel lying cheek by jowl with American steel, a perfect, if unintended, example of co-existence !

Equipped to carry out a wide range of work, the machine shop is chiefly engaged in producing spares urgently needed to keep going industrial concerns and tea factories in South India.

This department also handles the fabrication of H. & C. roll-breakers for the tea factories and rubber-rollers.

The principal output of the foundry department is iron castings, ranging from rollers to small hand-wheels. Other items are joints, clamps and bends for "Everite" asbestos pipes, widely used for water schemes in the State. Output could go well up to 600 tons a year, but is limited by "pig" supplies. Gunmetal and aluminium castings are also made on a smaller scale.

ALL-INDIA CONFERENCE OF LABOUR & WELFARE OFFICERS

by P. A. IBRAHIM, Personnel Officer

THE first All-India Conference of Labour and Welfare Officers was held at Bombay in April 1953; it was jointly sponsored by, among others, the Indian Conference of Social Work and the Indian Institute of Personnel Management. The second conference was held at Madras in February 1954. An important achievement of this conference was the adoption of a constitution for the All-India Council of Labour and Welfare Officers.

The third conference was held at Nagpur on December 2, 3 and 4, 1955. I attended the conference on behalf of our company. Well over 200 delegates and observers from all over the country participated.

The conference was inaugurated by Pandit Ravi Shankar Shukla, Chief Minister, Madhya Pradesh after Sri P. H. Bhutla, Ag. Chairman, Madhya Pradesh Millowners' Association and Chairman, Reception Committee had welcomed the gathering.

Pandit Shukla stated in his inaugural address that one of the objects of the conference was to study the principles and practices of industrial relations and labour welfare. The country had already adopted as its goal the establishment of a socialistic pattern of society. The first Five-Year Plan was nearing completion, and they were on the eve of the Second Plan. Geared to an industrial revolution, science and technology would increasingly be applied to harness the country's vast human and material resources for the larger good and well-being of the nation.

WORTHY ROLE EARMARKED IN THE FORGING OF WELFARE STATE

Describing Mahatma Gandhi as a prophet and a seer who could envision the shape of things to come, Pandit Shukla said that in Gandhiji's scheme of things, "Labour was the producer of wealth, and capital its trustee."

Continuing, Pandit Shukla observed that the necessity of welfare work had gone beyond the stage of debate, and the beneficial effects of welfare measures *for maintaining industrial peace and improving the efficiency of the working classes* were being recognised by all concerned. "Whatever money is spent on labour welfare, whether by Government or by industry, was well spent", he said.

Concluding, the Madhya Pradesh Chief Minister said, "**I fervently hope that your employers would give due regard to your place in the industrial set-up and promote the growth of the industry as a joint endeavour in the common good of both the employer and the employee, indeed, the whole community. A worthy role is earmarked for you in the forging of a welfare state.**"

Shri Shantilal H. Shah, Minister of Labour and Health, Bombay, and Chairman of the Council, put forward a spirited plea in his presidential address to employers and employees alike, to get rid of the habit of mutual blaming. The complex problems of industrial relations was not solved that way, he said. They had to work together in a spirit of goodwill and co-operation because what must ultimately influence their respective activities was the highest good of the largest number.

SECTIONAL MEETINGS

On the second day, the conference was split up into three separate sections at which papers were presented on the following subjects.

(i) Drawbacks of the existing conciliation machinery;

(ii) The idea of workers' participation in industry and

(iii) Organisation of a personnel department in large industrial undertakings.

Mr. M. S. Warty, Deputy Labour Officer, Millowners' Association, Bombay, presented the paper on the first subject. On the second subject Mr. M. R. Masani of Messrs. Tata Industries Ltd., Bombay, had prepared a paper, but in his unavoidable absence, it was presented by Mr. V. S. Gokhale, Asst. Labour Officer, Tata Mills, Bombay.

I attended the sectional meeting at which was presented a paper on the third subject—namely, "Organisation of a Personnel Department in large industrial undertakings" by Mr. T. J. D'Souza, Deputy Director of Personnel, Tata Iron and Steel Co., Jamshedpur.

Mr. D'Souza dealt with, in his paper, the various functions of a Personnel Department, such as the formulation of a personnel policy, recruitment and placement of workers, selection and training of supervisors and executives, negotiations with trade unions, joint consultation and promoting effective communication within the organisation.

In the discussion that ensued, I ventured the suggestion that in the matter of promotion from a lower to a higher grade within a certain limited circle, the claims of an older worker should not be overlooked. True, that by the promotion of a senior worker a good worker would be lost, but nevertheless it was desirable that a certain ratio should be maintained between outsiders and "insiders," I said.

In the matter of discipline procedures the practice in vogue on our company was pointed out which was that the Personnel Department acted as an observer, and a department other than that in which the employee was serving was asked to conduct the enquiry.

At the resumed sitting held on December 4, the Chairman of the Sectional Meetings presented reports and recommendations on the three main subjects. Some of the more important recommendations finally adopted by the plenary session are as under:

(1) Drawbacks of the existing conciliation machinery:

(i) The commencement and conclusion of conciliation proceedings should be clearly defined in the Industrial Disputes Act. The Act should also provide for serving notice of commencement and conclusion of proceedings to the parties concerned.

(ii) Conciliation proceedings should be concluded as early as possible within a prescribed time limit, which it is suggested, should be 30 days from the date of commencement of conciliation proceedings.

(iii) Conciliation proceedings should be preceded as far as possible, by a preliminary investigation by the Conciliation Officer for equipping himself with the full facts of the case and generally preparing the ground for a proper approach to conciliation. Conciliation should be undertaken only if every possible avenue of the internal machinery for the settlement of a dispute has been tried before.

(iv) The Conciliation Officer's report should be factual as far as possible, and should not contain any recommendation on the question of reference of the dispute to a Tribunal. Should the case be referred to a Tribunal, the report of the Conciliation Officer should not be passed on to it.

(v) In order to create a better atmosphere for the success of conciliation, it was felt that the proceedings before a Conciliation Officer should be left unhampered by the application of Sec. 33 of the Industrial Disputes Act, 1947. It was felt that this created a sense of irritation which was not propitious for the successful conduct

and culmination of conciliation proceedings. In this connection, it was also felt that there would be better chances for successful conciliation if Sec. 33 of the Act prohibiting strikes and lock-outs, was made applicable during such proceedings.

(vi) It was felt Government should exercise caution in referring cases for adjudication. For this purpose Government should have full discretionary powers in the matter of referring a dispute to a Tribunal and that if there was any hindrance in the existing law to the exercise of this discretion, the relevant provisions of the Act should be suitably amended.

(vii) It was felt that the success of conciliation or even industrial peace in general depended largely on the existence of a representative bargaining agent and it should be the endeavour of all concerned to encourage and develop such bargaining agents.

(2) The idea of workers' participation in industry:

"Resolved that this Conference affirms its faith in the system of collective bargaining, the joint consultative machinery and the association of workers in the administration of industries at appropriate levels in gradual stages. It is, however, of opinion that the participation of workers' representatives in the management and direction of industries is not feasible at present."

(3) Organisation of a Personnel Department in large industrial undertakings:

"Resolved that the following recommendations be adopted in regard to the organisation of a Personnel Department in large industrial undertakings, and for proper appreciation of the duties and responsibilities of Labour and Welfare Officers:

(1) To clarify and emphasise that the duties of the Personnel Department are primarily advisory in character except in the administration of

welfare activities and services which are of executive nature.

(2) To urge the adoption of a greater degree of uniformity and standardisation in the designation of Officers working in the Personnel Department.

(3) To do away with the designation "Labour Officer" as incorrect and inappropriate and replace it by the designation "Personnel Officer" which gives clearer indication of the scope and nature of the work involved.

(4) To relieve the Welfare Officer of the punitive functions imposed on him which falsify his position and undermine the confidence of the workers in him."

LABOUR PLAN

An interesting symposium on the "Labour Plan" to be incorporated in the Second Five-Year Plan was held in which over ten delegates took part. Various suggestions for improvement of the proposed draft or modification of some of the provisions in the Plan were put forward for the consideration of the Planning Commission. These suggestions related to the shift in the emphasis from State regulations of industrial disputes to one of collective bargaining, provision for co-operative schemes of labour welfare, etc.

An interesting programme of entertainment and visits had, also, been arranged. On the second day of the Conference, for instance, there was a concert programme by Bismillah Khan, the noted musician. Visits had been arranged to Ramtek, a village about 20 miles from Nagpur, hallowed by tradition and legend, and Sevagram, sanctified by Gandhiji's long residence in the place.

Several delegates spoke in appreciative terms of the fine arrangements that had been made for the Conference. With a vote of thanks, proposed by Mr. G. S. Annigeri, Hon. Joint Secretary of the Council, the Conference concluded.

A 220-kV double circuit trunk transmission line was recently constructed under the Nangal power project. It is the first of its kind in India and is a landmark in the progress of power projects in this country. This line stretches from Nangal to Delhi, a length of about 195 miles. There are two tapplings *en route* for the stepdown grid substations, one at Dhulkote (Ambala) and the other at Panipat.

This article explains briefly the salient features of this line and the methods of construction adopted on the various operations involved, beginning from the reconnaissance of the line route up to final completion and testing.

Reconnaissance of the Route

Before going out for the reconnaissance of the route, it was tentatively marked on a survey of India map of scale 1 in. = one mile. This gave a fairly good idea of the shortest possible route and served as a suitable guide for the work. This route was, of course, based on two tapplings to be made from this line *en route* between Nangal and Delhi, at Dhulkote (Ambala) and Panipet. Other important factors that were given careful consideration while deciding the tentative route were to avoid, as far as possible, (a) crossings over gardens, (b) railway tracks, (c) telecommunication and electric transmission lines, (d) marshy lands or water-logged areas, etc. At some places, however, it was impracticable or uneconomical to avoid some of these obstructions in which case extra expenditure became unavoidable and necessitated the provision of special features in the design of the line.

As the route of the transmission lines should not run close to any telecommunication lines, (as their proximity would set up induction effects in the telecommunication lines and thus adversely affect their operation), the minimum separation distance to be maintained has to depend upon factors like (a) the voltage and loading conditions of the transmission line, (b) the

length for which it is to run parallel to the telecommunication line, (c) the resistivity results of the supporting structures of the line. In case of this 220-kV line, the minimum separation distance was kept as one mile from the main telecommunication lines between Delhi and Ambala.

The proposed route of the line was carefully reconnoitred from Nangal to Delhi and all changes considered necessary were made on the tentative route marked on the survey of India drawings.

G. PARTAP SINGH

Detailed Route Survey

The proposed route, having been reconnoitred, survey parties were sent out to carry out the detailed route survey. For this purpose, a tachometer proved to be very useful. Combining the services of a theodolite, level and a measuring chain, it effects considerable savings in time and money. The completed detailed survey sheets showed all the factors of importance *en route*—railway tracks, canals, rivers, roads, telecommunication and electric lines, gardens and places of worship. Details of marshy lands and low-lying areas which were subject to floods were also given on the survey sheets.

Staking out

The job of staking out of a transmission line route, if carefully done can result in several economies like (a) minimizing the number of heavy angle towers, (b) avoiding such tower locations as would necessitate special foundations, and (c) minimizing the length of the line. Heavy angle towers involve more cost and may be considered to form weak points on the line being dead-end towers with jumpers on the line conductors. The staking out parties should be provided with the tentative locations of the proposed transmission line pylons marked on the detailed route survey sheets based on the standard spans of the line. These

It is the privilege of Aluminium Industries to be first with the first, as a section of the Nangal-Delhi line is built of 'ALUND ACSR'—GOAL—0.3 sq. in. eq. cu.

tentative locations can only be a guiding factor and at many places departures may be necessary to suit actual requirements of ground clearances, maximum permissible spans, uplift and angles of deviations of the line, etc. For example, in their terms of agreement, the Northern Railway had stipulated that the transmission line should cross over the railway track at right angles. However, if an angle was inevitable, it must not be less than 60° between the railway track and the transmission line. In order to provide the minimum permissible ground clearance for the line conductors, profiles were taken at the location of the uneven lands *falling en route*, and L-sections were drawn for the locations where the line had to cross over the main roads, canals, railway track, etc. Boundary pillars were planted by the staking parties on all the angle locations and also after each mile of the straight run of the line, so as to ensure that obligatory locations were not lost till construction was taken in hand. After the route for the line was staked out, the survey sheets showing the staked-out locations were very carefully studied, and those sections were restaked and certain improvements effected.

Construction of the Transmission Line

Having staked out the line route and before taking in hand the construction work, adequate arrangements were made with regard to materials, tools and plant, transport, tentage, and skilled labour. Experience has shown that it is generally not feasible to collect first the entire lot of materials required for use on major transmission lines and then take the construction work in hand. For one thing, most of the materials have to be obtained from manufacturers located at far off places, and some from abroad. Sometimes, manufacturers find it difficult to supply the whole lot in a short span of time, and also at times their delivery programmes are hampered by non-availability of raw materials or restrictions on railway bookings, etc. Likewise, materials expected from abroad do not sometimes reach

destinations according to schedule. In the circumstances, the best way considered advisable is to take up work if at least about 60 per cent of the entire requirements is available.

The temporary stores depots for materials should be suitably located at intervals of say, 10 to 15 miles, each, keeping in view of course such advantages as proximity to a railway station or a main road.

Transport

In order to achieve efficient and economical progress on work, it is necessary to ensure that supplies to the works are uninterrupted. Any breakdown in the supply line would spell a set-back to progress. On the construction of the Nangal-Delhi 220 kV line, over 250 tons of materials per mile of line had to be transported to sites of work in the field. As such, a fleet of vehicles had to be maintained. For use of one construction party which handled all the various jobs on the line, the vehicles provided were, one 40 h.p. crawler tractor, one 25 h.p. wheel tractor, a 5-ton truck, two 3-ton trucks, one jeep and one water tank trailer. In addition to these vehicles, two units of two-wheel low key trailers for mounting the conductor drums were also provided. Light and cheap trailers were designed and manufactured by the staff working on the line. The crawler tractor was found very useful for the stringing and sagging of conductors; the wheel tractor was used for carrying the low bay trailers for the laying of conductors.

Tools and Plant

An adequate quantity of suitable tools and plant is another indispensable condition for construction work. Some articles have to be made to suit particular sizes of conductors and earthwire the snatch-blocks or the rollers used for the stringing of conductors should have grooves to suit the conductors and they should be strong enough with good bearings to take the load and work freely. On this 220-kV line, aluminium rollers of 9 in. diameter with 1½ in. groove each with two sets of ball bearings were used. Another important item was the come-along clamps, or automatic clamps. These clamps are required for holding the conductors in tension during the course of stringing and sagging and were manufactured in the

departmental workshops. Rather a precision job this making clamps strong enough and which would safely take the maximum tension that would be applied during the construction work. Suitable winches with effective brakes and dependable steel ropes were also required for conductor stringing. Also, small petrol-driven and hand-operated pumps were necessary for use in water-logged areas. Hydraulic appliances for making joints and ending cones of ACSR conductor and endwires were also required. These are all examples of the various type of tools and plant required.

The entire field staff was provided with tents for accommodation. This enabled them to stay close to the site of work.

Excavations for Tower Foundations

A staking out party went first to give marks as pin-points on each tower location according to the line route previously staked out. This party was followed by excavation parties who carried out excavations for tower foundations at the locations. Each excavation party was provided with a wooden template made to allow the most economical amount of excavation consistent with the dimensions of the tower footings. Three pin-points were necessary on each location to ensure correct alignment. The normal span adopted on a 220-kV line being 1,000 ft., there were just over 5 towers per mile. Normally, the excavation for tower foundation is a simple job, but in water-logged areas, it sometimes presents difficult problems and the pits have to be "timbered". The size of the excavation pits on this 220-kV line varied from 7 × 7 × 7 ft. deep to 13 × 13 × 13 ft. deep (for each of the four legs of the tower) depending upon the type of towers. About 10 per cent of the locations on this was water-logged, and some of these were such that the water was standing on the ground as the soil was sandy and marshy. In such locations the usual timbering was not found to be effective and so masonry wells had to be sunk (4 wells per tower). The best period for working on excavations in water-logged areas was found to be from the middle of March to the middle of June when the water-table from the ground level went down for its lowest.

LAYING OF CONCRETE FLOORS AND STUB SETTING

Experience has shown that in many cases, where the tower steelwork has not been fitted on concrete floors, salts in the soil badly damage the grillages in some cases within a score of years. On this 220-kV line, therefore, 6-inch thick floors were provided on all the tower foundations.

After the concrete floors had been cured, the steel stubs—that is, grillages of the towers, were set on the floors in the required positions and levelled by means of steel templates, above the ground-level.

Earthing and Concreting the Tower Leg Foundation Stubs

It is desirable to keep the tower footing impedance of the transmission line towers as low as economically possible. This improves the characteristics of the transmission line by mitigating the effects of lightning. It also reduces the effects of induction in the telecommunication lines that may be located in the vicinity of the high voltage transmission lines. According to general practice one of the main footings of each tower on this 220-kV line was connected through a copper strip to a G.I. pipe 1 in. diameter and 6 ft. long, driven into the ground in the excavated pit. The foundation legs of these towers were concreted in pyramid-shaped formers as shown in Fig. 1. The concreting of tower leg foundation is a job needing very strict supervision. Shingle and sand must be thoroughly washed before use. To obtain good results for the finished concrete, it is necessary that the wooden formers, used as moulds, are made water-tight so as not to allow any cement slurry to ooze out while the concreting is in progress. A gang of 35 men comprising skilled and unskilled labour normally took one day to concrete the foundations of a 1 tower of this line, but on a heavy tower it took them two days to do it.

As already stated, about 10 per cent of the tower locations was found to be water-logged. In some cases, the water-table was encountered near abouts the bottom of the pit, but in others, excavation had to be carried out in water for two feet and more. Such foundation pits required box timbering so as to ensure safety for the workmen and also to protect the

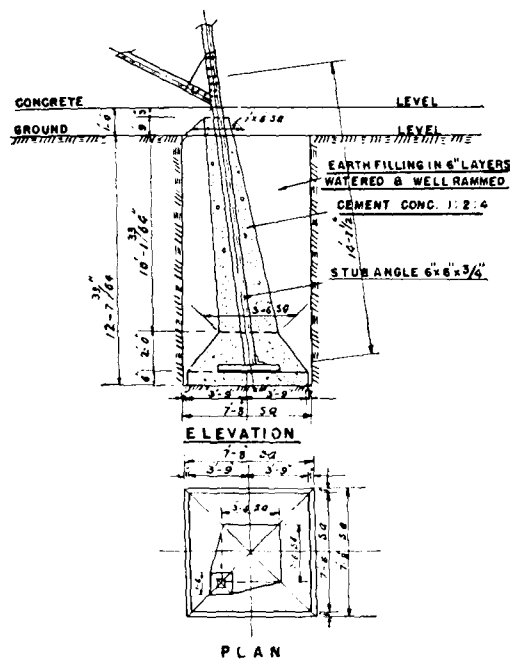


Fig. 1 — Tower Foundation.

concrete before the initial set. However, in a few cases where the water was standing above the ground level even timbering could not serve the purpose as the water could not be pumped out as effectively as necessary and consequently well-sinking was carried out in brick-work.

After the finished concrete had been properly cured the foundation pits were back-filled with earth. The pits were completely back-filled excepting the top 3 ft. portions of concreted legs including one foot above the ground level. This 3-foot portion of concreted legs was given a coat of hot coal-tar so as to make it impervious to moisture.

Tower Superstructure

The erection of tower superstructure is indeed a very important item of work, requiring well-trained and experienced labour. The minimum height of a 220-kV tower used on this line is 102 ft. above the ground level. Usually, there are two methods for erecting a tower superstructure: one is to assemble the complete structure on the ground and then hoist it in position by means of a derrick; the other is to fit the steel member of the superstructure, one by one, on the foundation legs and thus proceed upwards and complete the whole structure. The latter method was adopted on this line. The 102-foot high steel superstructures used for these towers were erected in five or six stages

depending upon the types. The very first member to be erected was one of the main legs of the first stage, which was erected into position by means of a pipe pole derrick. Similarly, the other three legs were put up and the first stage was completed by fitting cross-bracings, etc. Then the derrick was lifted and put up in a secured position near the top of one of the main legs of the first stage already erected. In this way the lifted-up derrick was used for hoisting the superstructure members for the second stage. Similarly, the other stages of the tower up to the top were completed. This process was adopted in the initial period of erection, on a slightly different method was adopted as it was found more effective. The leg members of the first, second and third stages for one of the four legs of the tower were assembled on ground, and as these were hoisted into position by a pipe pole derrick and then the other three main legs, similarly assembled, were placed in position. All these four legs (up to three stages) were kept in position by rope guys, while the various cross-members, bracings, etc., were assembled and fixed to the legs in the same way. By this method the entire superstructure was erected in two-thirds the time taken by the former method. Care must, however, be taken to ensure that during the erection of superstructures, only the correct tower members are supplied to the erectors working aloft. Normally a gang of 22 men, (both skilled and unskilled), would be able to erect about three-fourths of a straight line tower per day. Fig. 2 shows a photograph of a 220-kV transposition tower nearing completion.

About 400 galvanised steel members were required to complete one superstructure in addition to about 1,400 nuts and bolts.

Fixing Insulator Strings

After the erection of towers, the insulator strings were fitted on to the cross-arms. For doing this job, care is needed on the following points:

- No chipped or cracked insulators should be allowed to be used in the strings.
- None of these should be damaged while the strings are being fitted into positions on the tower cross-arms, and if damaged, they should be replaced.

(c) The split-pins in the sockets of the insulator discs should be properly split up in each disc while being assembled into a string.

(d) Insulators of specified strength should be fitted on to the respective types of towers. The insulators used on the 220-kV line are shown in Table I.

TABLE I

NO. OF INSULATOR DISCS STRENGTH OF EACH INSULATOR DISC

1. On 220-kV lines, over the railway track in right angles. However, if an angle was inevitable, it must not be less than 60° between the railway track and the transmission line. In order to provide the minimum clearance, the insulator discs when the insulator discs are suspended from the tower cross-arms will be increased to 10° per string. No other change whatsoever will be necessary on the line. At road crossings, one extra disc has been used for each insulator. Grading rings have been used on the conductor ends of the insulator strings.

Paying out the Conductors

The particulars of the ACSR conductor and earthwire used on this line are given in Table II.

As aluminium is a soft metal, it requires all precautions against damage in the shape of scratches, kinks or cuts, etc., while the conductors are being stretched along the line, strung or

being sagged. The paying off of the conductor along the line can be done in two ways. Firstly, it may be pulled from one end while it rolls off the drum which is mounted on a drum wheel stationed in position at one place. Alternatively, the conductor drum may be mounted on a wheel drum or a suitable trolley which is carried along the line route by a tractor, and the drum, while it is being carried forward, is unrolled and the conductor laid on the ground.

The latter method is considered more desirable and should be adopted where it is possible to achieve the same economical progress on work, it is necessary to ensure that supplies to the works are uninterrupted. Any breakdown in the supply line would mean a stoppage of work. On the line of 220-kV, the length of the line was 1-Delhi 220-kV line was not a problem due to the difficult topography of the land and so the conductor had to be pulled. Here, again, suitable wooden rollers were placed at a number of locations so that the conductors rolled over them, and did not rub against the rocky ground.

For the laying of the conductors described above, a special type of two-wheel pneumatic trolley which was designed and manufactured departmentally was used. This low and light trolley could be tilted on its rear end and the conductor drum (weight 2-3 tons), carrying the steel spindle in it, was slid in the grooves provided in the frame of the trolley. The trolley was carried by a 25 h.p. wheel-tractor and this combination was found very convenient and efficient for running in fields along the line.

The jointing of ACSR conductors is a skillful job. A hydraulic compressor complete with steel dies is required for applying compression type accessories. For any one size of ACSR conductor, two sizes of dies are required, one for applying the aluminium portion and the other for applying the steel portion of joints. Hand-operated portable hydraulic compressors were found quite efficient for use in the field.

Normally a pressure of 50-70 tons is enough for joints or comparatively bigger conductors as used on this line. While making a joint, pumping should be stopped when the dies barely come together. Any further pumping does no good and causes unnecessary overload on the system.

As the leather and metallic washers used in the compression machine required replacements off and on under heavy rush of work, it was very necessary to keep a few sets of washers as spares.

Stringing of Conductors

The work of stringing conductors is an important one in the construction of transmission lines. Each conductor, after it has been laid along the line, should be raised to the snatch-rollers hanging from tower cross-arms and laid in. Normally, the maximum stretch of line for pulling up the conductors at a time should not exceed 4 to 5 miles, that is, the conductors should be dead-ended in about this length of the section. On this 220-kV line no section exceeded 5 miles. An anchor tower or a heavy dead-end tower is always desirable at the point of pulling up so that the conductors may finally be anchored off after they are strained. At the tower selected for pulling up, the conductors are carried over the rollers (hanging from the cross-arms) and are brought down to a come-along clamp. These come-along clamps are such that their grip on the conductor automatically increases with the increase in the tension of the conductor. The safety of men and materials lies in the dependability of these clamps. On the construction of this line, crawler tractors, both with and without winch, were used. But the one with the winch certainly proved to be more efficient. The normal tension on which these ACSR conductors (0.3 sq. in. equivalent copper) were required to be sagged was nearly 6,500 lb. However, they were steadily pulled up until the actual load

was substantially above the tension finally required. The object of doing this was to take the stretch out of the conductor, and thus ensure that under working conditions there shall be no slow increase in sag due to the settling down of the conductor. As the conductors are pulled at one end of the line for rough sag, they would run through the aluminium rollers (snatch-block) hanging from the cross-arms and consequently the rollers would rotate. If any of the rollers gets jammed, the conductor in motion may slip out of the groove of the roller and get damaged. The diameter of the finished straight joint on the conductor is about twice the diameter of the conductor itself. So when joints pass through the snatch-block as the conductor is being pulled through, it must be ensured that the joints do not get stuck. For this purpose, therefore, one linesman should take up position on each tower, with red and green flags in his hand, so that in an emergency he can signal to the supervisor conducting the stringing operation to cry halt. The joint can then be pushed through the snatch-block by him. To ensure smooth working, the snatch-blocks for use on such big transmission line should be manufactured to suit the particular conductor.

Sagging

The conductors are now running through the rollers hanging from the tower cross-arms, under a certain tension. A proper sag has to be given to the conductors. For this purpose a wooden batten about 1 x 2 in., painted white, is fixed horizontally on to each of two adjacent towers at the desired level. A linesman on one tower keeps his line of sight between the battens, and the conductor is slowly let down until he signals about the correctness of the sag. The sag chart adopted on the 220-kV line for the ACSR conductor and earthwire are shown in Figs. 3 and 4. Only the top conductor may be sagged in this way and the others adjusted accordingly. On this 220-kV line, steel earthwire 19.0104 in. was used from

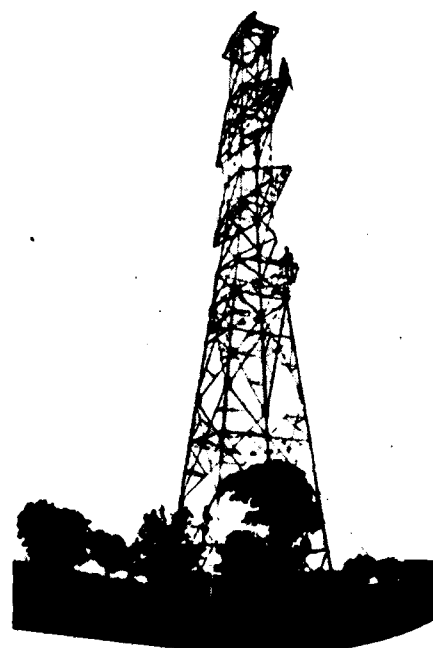


Fig. 2 — A 220-kV Transposition Tower.

TABLE II PARTICULARS OF ACSR CONDUCTOR & EARTHWIRES USED ON 220 kV LINE

STANDARD NOMINAL COPPER AREA (SQ. IN.)	NO. AND DIA. OF STRANDS (in.)		OVERALL DIA. (in.)	APPROX. ULTIMATE STRENGTH (LB.)	WT. IN LB. PER 1000 FT.
	Aluminium	Steel			
	No.	Dia.	No.	Dia.	
Conductor 0.3 sq. in.	30	0.146	7	0.116	1004
Earthwire 0.078 sq. in.	12	0.1151	7	0.1151	

Higher target

In spite of an addition of 1.1 million kW of new capacity, the country's power supply position at the present time is not satisfactory. Everywhere the demand for power is continuously on the increase. It has, therefore, been decided that, for the Second Plan, a much higher target would be necessary. In addition to the needs of ordinary consumers, provision has to be made for the power required for the large industrial programme included in the Second Plan. It has been estimated that about 1.2 million kW of additional power demand would arise on account of the normal development of medium and small industries and for commercial and domestic consumption. A further demand of 1.4 million kW is expected from the large industries. Allowing for standby capacity in power stations and for seasonal variations in the waterflow for hydro-electric stations, it is estimated that about 3.4 million kW of power plant would be required to be installed during the next five years. This means that the existing total capacity of 3.4 million kW would increase to 6.8 million kW by March, 1961. Of this additional 3.4 million kW, 2.9 million kW will be installed by the State undertakings, 0.2 million by the electric supply companies and 0.3 million by certain industries like the lignite mines, steel factories, cement and paper mills. The output of electrical energy is expected to increase from 11,000 million units in 1955-56 to 22,000 million units in 1960-61 representing an increase of 100 per cent.

The Second Plan provides for 35,000 miles of new transmission lines of 11 kV and above. About 7,500 additional small towns and villages will be provided with electricity. The *per capita* consumption is expected to increase from the present level of 25 units to about 50 units at the end of the Second Plan.

The Plan includes 42 power generation schemes of which many are new

schemes and some are extensions to existing power stations. Of the 42 schemes, 23 are hydro-electric schemes and 19 are steam-power stations. In terms of capital cost, 9 schemes cost over Rs. 10 crores each, 4 schemes cost between Rs. 5 and Rs. 10 crores each and the remaining 29 cost below Rs. 5 crores each. The bulk of the new generating capacity will be derived from hydro-electric stations. Actually, of the 2.9 million kW of capacity planned in the public sector, 2.1 million kW will be hydro-Plant and the remaining 0.8 million kW thermal plant. The 0.2 million kW planned by the electric supply companies and 0.3 million kW by the industrial establishments will also be thermal plant.

Hydro projects in Second Plan

The important hydro-electric projects which will be started in the Second Five-Year Plan are Yamuna in the Uttar Pradesh, Ranapratapsagar in Rajasthan, Konar in Bihar, Hirakud II Stage in Orissa, Ukai in Gujarat, Purna in Hyderabad, Sileru in Andhra, Kundah in Madras, Sharavati in Mysore and Panniar, Sholayar and Pamba in Travancore-Cochin. Among the thermal power stations, mention may be made of Harduaganj Extension in the Uttar Pradesh, Barauni in North Bihar, Bokaro Extension and possibly another new power station in the DVC area, Korba and Extensions to Khaperkheda in Madhya Pradesh, a large lignite power station at Neiveli in Madras and a number of medium-size power stations in Saurashtra, Assam, Vindhya Pradesh and Bhopal.

In regard to the electrification of towns and villages, practically all the medium and large towns with a population above 20,000 will be electrified by the end of the First Five-Year Plan. An important part of the Second Plan is to provide electric supply for small towns in the population group of 20,000 to 5,000. These small towns are centres for the development of adjoining rural areas—



Mr. V. T. Krishnamachari.

providing marketing, credit and other facilities needed by them and sustaining the urban industries needed for supplies of consumer goods to them. In this group, there are about 4,000 small towns in all and so far about 40 per cent of them have been electrified. In the Second Plan, it is our intention that 80 to 90 per cent of these should be provided with electricity.

Rural electrification suffers by lack of what is called load density unlike the concentrated urban areas. It is for this reason that incentive in the form of lower rates will have to be given to rural consumers. A practical way will be to consider the urban and rural schemes in an integrated manner so that the surplus from the revenues realised from the urban and industrial consumers can go to help the rural rates over a term of years. It is necessary that this principle should be followed in all grid systems to an increasing measure.

—From a radio talk by Mr. V. T. Krishnamachari, Dy. Chairman, Planning Commission.

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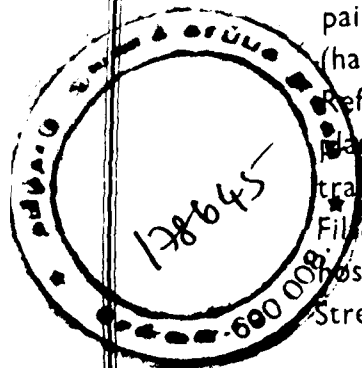
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